2006

# Sustainability and Company Annual Financial Reporting

Mirela Filipovic
*Edith Cowan University*

# Edith Cowan University

# Copyright Warning

# USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

# Sustainability and Company Annual Financial Reporting

**By**

**MIRELA FILIPOVIC**



A Thesis Submitted in Partial Fulfilment of the Requirement for the Award of

**Bachelor of Business Honours (Accounting)**

At the Faculty of Business and Law
Edith Cowan University

Date of Submission: 27 June 2006

## ABSTRACT

This study had two main objectives. Firstly to measure the level and type of sustainability reporting in companies using the Global Reporting Initiative (GRI) Index. Secondly, to investigate the key characteristics of Australian listed companies that explain the extent of voluntary sustainability information within their annual reports. Based on the positive accounting theory framework and the review of literature six testable hypotheses were developed. The six directional hypothesis developed were related to two aspects of agency and political costs and included ownership diffusion, leverage, audit by big four audit firm, size, profitability and industry type.

A stratified sample of 450 companies was selected from the Fin Analysis Database at Edith Cowan University for the 2004 annual year. Content analysis was performed on each of the 450 company annual reports. The number of GRI indicators reported was recorded for each company. Using the Fin Analysis Database further information was collected about the organisational characteristics of sampled companies such as ownership diffusion, leverage, audit firm, size, profitability and industry type. Data was analysed using the Statistical Program for Social Science (SPSS). Descriptive statistics were employed to determine the level and type of sustainability reporting in company annual reports. To provide further descriptive information on the date univariate analysis was performed. Ordinary least square multiple regression was used for the second objective of the study. Namely, to test for key characteristics that explain the extent of voluntary sustainability information within their annual reports.

The findings indicate that the level of sustainability reporting in annual reports in low, out of 450 annual reports viewed 100 companies reported on sustainability information. It was identified that companies tend to disclose on common GRI indicators. The most commonly disclosed indicator was a social indicator which referred to health and safety. It was noted that the level of disclosures for social indicators was higher then for environmental indicators. The top nine commonly reported indicators consisted of

fourteen social and eight environmental factors. The number of companies disclosing and the level of disclosure differed between industries and companies audited by big four audit firm. Companies from consumer staples, energy, industrials and materials sectors disclosed more information then companies from utilities, telecommunication services, health care and consumer discretionary. Companies audited by big four audit firm disclosed more than companies not audited by big four audit firm.

The results from this study indicate that certain variables from positive accounting theory are able to explain the level of voluntary sustainability reporting in annual reports. Variables such as size and industry are highly significant and therefore able to explain the level of sustainability reporting in annual reports of sampled companies. The four variables found to be insignificant in this study include ownership diffusion, leverage, big four audit firm and profitability. These variables are not able to significantly explain the level of sustainability reporting in annual reports. Nevertheless, ownership diffusion and leverage are moderately significant and all variables are in the expected direction.

The findings of this study have implications for the users of annual reports, the regulators of financial information in Australia, preparers of annual reports and policy and decision makers. The information is useful for users of annual reports as they now have an insight into sustainability reporting. Users will now be able to associate company characteristics with the extent of voluntary sustainability disclosure. For the regulators of financial information the findings of this study indicate that the preparers of annual reports do not appear to care much about voluntarily disclosing sustainability information. These results indicate that should regulators proceed with the introduction of a sustainability standard they may encounter opposition of preparers of annual reports, thus a lengthy transition period may be required prior to the introduction of a standard on sustainability. Especially if this is based on the GRI index. Furthermore, the implication for preparers include more training, time, hence cost in reporting of this type of information. For policy and decision makers this may mean creating or making changes to the existing policies and guidelines to address all aspects of sustainability reporting.

## DECLARATION

I certify that this thesis does not, to the best of my knowledge and belief:

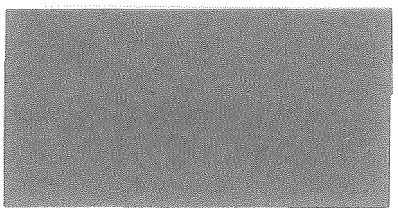
i. incorporate without acknowledge any material previously submitted for a degree or diploma in any institution of higher education;

ii. contain any material previously published or written by another person except where due reference is made in the text; or

iii. contain any defamatory material.

iv. i also grant permission for the library at Edith Cowan University to make duplicate copies of my thesis as required

Mirela Filipovic



Date: 27 June 2006

## ACKNOWLEDGMENTS

I would like to acknowledge and thank the following people who have provided valuable supervision, support and guidance in the completion of this thesis:

- Dr Theo Christopher, in his capacity as supervisor, for his ongoing advice, support and encouragement to complete this thesis.

- Professor Malcolm Smith, Dr Charles Huang and other participants of Edith Cowan University, School of Accounting, Economics and Finance Research Seminar for their valuable comments.

- Everyone within Edith Cowan University's Risk Management and Audit Assurance department for their understanding and support for my study.

- Finally, I would like to thank my supportive and understanding family for their advice and patience during the completion of this thesis.

# TABLE OF CONTENTS

Page Number

**Page Number**

## LIST OF TABLES

## LIST OF APPENDICES

# CHAPTER 1
# INTRODUCTION

## Statement of Problem

Over the years and in recent decades importance of social and environmental responsibility has been steadily increasing due to the major changes in our society. In Australia and many other countries in the world, this importance has highlighted the need for companies to be concerned with social and environmental aspects of their business performance. In light of these changes, some organisations have started voluntarily disclosing sustainability information within their annual reports.

According to recent literature sustainability reporting means disclosing information on three aspects of organisational performance including economic, social and environmental (Rarr, 2002). It is also in some cases referred to as triple bottom line reporting. Sustainability reporting differs from the original environmental and corporate social reporting as it provides additional information of economic and social nature. Recent studies have indicated that reporting on sustainability is a growing trend worldwide (Kolk, 2003, 2004 and 2005). Frost, Jones, Loftus and Laan. (2005a) noted that Australia lagged behind other developed countries in reporting on sustainability.

Based on prior definition by Meek, Roberts and Grey (1995, p. 555) voluntary disclosures are "disclosures in access of requirement (and) represent free choices on the part of company management to provide accounting and other information deemed relevant to the decision needs of users of that annual report". However according to Mathews and Perera (1995, p. 364) voluntary disclosure is "an extension of disclosures into-non traditional areas such as providing information about employees, products and community services and prevention or reduction of pollution."

Whilst voluntary sustainability reporting provides useful information, this type of reporting also takes time, money and effort and it is currently unclear as to why certain organisations choose to disclose this information whilst others do not. Many theories have proposed to explain factors influencing firms voluntarily disclosure of information in an annual report. Voluntary disclosures in annual reports are not new, and have been utilised by Australian companies for providing other voluntary information (Trotman, 1979; Guthrie and Parker, 1989; Pang, 1982; Gibson and O'Donovan, 1994; Gibson and Guthrie, 1995; Rockness, 1985; Zeghal and Ahmed, 1990; and Deegan and Gordon, 1994).

Due to these trends, and the perceived importance of this information the financial regulators in Australia are also currently reviewing the possibility of extending directors and officer's duties to extend into areas of corporate social responsibility and sustainability. However, the problem lies with the fact that regulators are unsure of the response they will get should they proceed with introducing a standard on corporate social responsibility and sustainability. Given this trend and the differences between companies in this type of reporting it is of interest to examine the extent and type of voluntary sustainability reported and the characteristics of Australian listed companies that explain the extent of sustainability disclosure.

**Research Objectives**

There are two main objectives of this research study. The first objective is to measure the level and type of sustainability reporting in Australian listed companies using the Global Reporting Initiative (GRI) Index. The second objective is to explain using the positive accounting theory framework, the key characteristics of Australian listed companies that explain voluntary sustainability information within their annual reports.

## Significance

This research will have both practical and theoretical significance. Firstly, it will measure the level of sustainability reporting across the different companies and industries, for a larger sample size than previously undertaken. Secondly, it aims to explain the reasons for the differences by linking these to the positive accounting theory framework. This will be of particular significance because previous studies have not used positive accounting theory to explain the differences in the level of reporting on sustainability. Thirdly, the results will be of interest to the regulators of accounting information who are currently investigating the possibility of sustainability disclosure rules. The results will be of interest to lenders concerned in lending to companies that report sustainability information. Finally, investors would also gain insight into the voluntary sustainability disclosures in annual reports.

## Organisation of the Study

This thesis is organised in eight chapters. Chapter one introduces the topic by stating the research problem, research objectives, outlining the significance and providing the organisation for the study. Chapter two discusses the Global Reporting Initiative (GRI) Index and other sustainability indexes by providing the most recent literature on sustainability indexes. Chapter three presents the literature review covering the most recent and relevant studies on the extent and type of sustainability reporting and characteristics of companies reporting sustainability information and also covering other literature on sustainability. Chapter four explains the theoretical framework employed in the study and discusses the development of hypotheses. Chapter five outlines the research methodology for the study. Chapter six presents the sustainability disclosure analysis, with chapter seven presenting the univariate and multiple regression results. Finally, chapter eight concludes the study by summarising the main findings and presenting the limitations, implications and suggestions for future research.

# CHAPTER 2
# SUSTAINABILITY INDEX

## Introduction

The objective of this chapter is to present the sustainability index selected for this study. The index selected for this study is the Global Reporting Initiative (GRI). This chapter is designed to present the need for a sustainability index, development of Global Reporting Initiative (GRI) index, the use of the index, description of the index and criticism of the index. Another objective of this chapter is to identify other sustainability indexes and to explain why the GRI index was selected over other sustainability indexes.

## The Need for Sustainability Index

Over the years there has been a trend towards reporting of non-financial performances by many organisations, one of the most recent trends is towards reporting of sustainability information. Based on the Rarr (2002) definition, sustainability reporting means reporting on three perspectives of organisational performance including economic, environmental and social performance. Reporting on economic performance is not a concern, as accounting standards exist on how the information should be reported; it is a matter of following the existing standards. The real concern is the reporting of environmental and social performance. The problem is that environmental and social reporting is voluntary, and there are no current mandatory procedures or formats for reporting. The lack of guidelines on how to report on sustainability has caused much confusion among companies and has resulted in reporting that is incomparable and inconsistent. This has provided little value for the users interested in comparing sustainability performance for a number of companies. Due to the lack of guidelines in the past and the apparent problems resulting from this, the need for sustainability guidelines was highlighted. To combat the problems arising from lack of guidelines a number of organisations started to produce voluntary guidelines for sustainability reporting.

**Development of the Global Reporting Initiative (GRI) Index**

The Global Reporting Initiative (GRI) index was one of many sustainability indexes introduced to make the reporting of sustainability reporting more standard (Deegan, 2001). The initiative was introduced by United Nations Environment Program (UNEP) and Global Compact as a response to the growing trend in sustainability reporting. The GRI organisation is backed by the United Nations and includes members from all areas including trade unions, campaign groups, accountants and academic. These members are responsible for the development of guidelines that are applicable for all organisations anywhere in the word (Maitland, 2002). The initial guidelines were released in March of 1999, these were in the draft format. They have since been twice reviewed, in 2000 and 2002. The guidelines are also currently being reviewed in 2006 (GRI, 2005). Since its introduction the GRI guidelines have gained high praise and reputation as the most respected and comprehensive guidelines for sustainability reporting (Maitland, 2002).

**The Use of GRI**

The use of the GRI guidelines is worldwide. According to Maitland (2002) this is due to the guidelines being developed for global use and because they are highly comprehensive. In Australia recent studies have also indicated that GRI is the preferred format for those organisations that report on sustainability (Frost et al. 2005a; KPMG Survey into Corporate Social Responsibility, 2005; Australian Government Department of the Environment and Heritage, 2005; Australian Government Department of the Environment and Heritage 2004).

For this reason the Global Reporting Initiative (GRI) index was selected to be used to measure the level of suitability reporting in this study. Each company will be scored for each indicator reported. The index consists of a number of voluntary indicators to be reported on. These are grouped into core environmental and core social indicators. Core environmental indicators to be reported on are materials, energy, water, biodiversity, emissions, effluents and wastes, products and services and compliance. Core social indicators include labour human rights, and product responsibility.

**Description of the GRI index**

As one of the most comprehensive sustainability indexes, the GRI covers a number of social and environmental issues. The index can be grouped into two performance measures, comprising sixteen core environmental and twenty-four core social factors. A number of indicators represent the core environmental and core social factors. Within the environment indicators companies can disclose on materials, energy, water, biodiversity, emissions, effluents and wastes, products and services and compliance. Core social indicators include labour employment, labour management relations, labour health and safety, labour training and education, labour diversity and opportunity, human rights strategy and management, human rights policies/ procedures and management systems, and product responsibility, policies procedures and management systems. Table 2.1 presents the summary of core indicators of the Global Reporting Initiative (GRI) index. This summary of the index is as used in the Frost et al. (2005a) study.

*Environmental Indicators*

As can be seen on Table 2.1 for environmental indicator of materials companies are required to disclose on the total materials used by type and the percentage of waste materials used from external sources such as recycling. Energy indicator companies are required to disclose direct energy use in joules segmented by primary resource and indirect or purchased energy use in joules. While water indicator companies are only required to disclose total water usage. Biodiversity indicator requires disclosure on location and size of related land and biodiversity (rich habitats) and description of major impacts on biodiversity. Emissions, effluents and wastes requires disclosure on greenhouse gas emissions, use of emissions of ozone deleting substance, other significant air emissions, total amount of waste by type and method of treatment, significant discharge of water by type and significant spills of chemicals/oils/fuel and volume. Products and services companies are required to disclose on significant environmental impacts of principal products, percentage of product sold that is reclaimable, and the actual reclaim. Finally, companies are required to disclose the number of incidents and fines for non-compliance, if none a statement of compliance.

*Social Indicators*

As can be seen on Table 2.1 for social indicator labour/ management relations companies are required to disclose percentage represented by the trade union and polices and procedures relating to change like restructuring. Labour health and safety indicator companies are to disclose on practices on recording and number of notifications of incidence and disease and how they relate to the ILO code of practice, description of formal joint health and safety committees, standard injury, lost day and absentee rates and number of fatalities and polices and programs for HIV/AIDS. For labour training and education, companies are to disclose hours of training per employee per year, by category of employee. Labour diversity and opportunity requires disclosure on description of equal opportunity policies and programs, composition of senior management and corporate governance bodies including male and female ratios.

Human rights strategy and management requires disclosure on description of policies, guidelines, corporate structure and procedures to deal with all aspect of human rights, evidence of consideration of human rights impacts as part of investment and procurement decision and description of polices and procedures to evaluate and address human rights performance within the supply chain and contracts. For human rights policies/ procedures and management systems companies are required to disclose on discrimination, freedom of association, child labour and forced and compulsory labour.

Society polices/procedures and management systems requires disclosure of impact of operations on community, bribery and corruption and political lobbying and contribution. Finally for the social factor product responsibility policies/procedures and management systems companies are to report on customer health and safety, product information and labelling and consumer privacy.

**Table 2.1**
***Global Reporting Initiative (GRI) Index***

| Core indicators | Description |
|---|---|
| ENVIRONMENTAL | |
| **Materials** | |
| EN1: | Total material used by type |
| EN2: | Percentage of waste materials used from external source (recycling) |
| **Energy** | |
| EN3: | Direct energy use in Joules - segmented by primary resource |
| EN4: | Indirect energy use in Jules (purchased) |
| **Water** | |
| EN5: | Total water use |
| **Biodiversity** | |
| EN6: | Location and size of related land in biodiversity - rich habitats |
| EN7: | Description on major impacts on biodiversity |
| **Emissions, effluents &** | |
| EN8: | Greenhouse gas emissions |
| EN9: | Use/emissions of ozone deleting substance (CFC -11 equivalents) |
| EN10: | Other significant air emissions by type (e.g. Nox, Sox) |
| EN11: | Total amount of waste by type and method of treatment |
| EN12: | Significant discharge of water by type |
| EN13: | Significant spills of chemical/oils/fuels in number and volume |
| **Products & services** | |
| EN14: | Significant environmental impacts of principal products |
| EN15: | Percent of the weight of product sold that is reclaimable and actual reclaim |
| **Compliance** | |
| EN16: | Incidents of and fines for non-compliance |

**Table 2.1 (Continued)**
***Global Reporting Initiative (GRI) Index***

| Core Indicators | Description |
|---|---|
| SOCIAL | |
| **Labour: employment** | |
| LA1: | Breakdown of workforce |
| LA2: | Net employment creation and average turnover segmented by country |
| **Labour: labour/management relations** | |
| LA3: | Percentage represented by trade union |
| LA4: | Policy and procedures relating to changes like restructuring |
| **Labour: health and safety** | |
| LA5: | Practices on recording and no. notification of incidence and disease and how they relate to the ILO code of practice |
| LA6: | Description of formal joint health and safety committees |
| LA7: | Standard injury, lost day, and absentee rates and number of fatalities |
| LA8: | Policies and programmes for HIV/AIDS |
| **Labour: training and** | |
| LA9: | Hours of training per employee per year, by category of employee |
| **Labour: diversity & opportunity** | |
| LA10: | Description of equal opportunity policies and programmes |
| LA11: | Composition of senior management and corporate governance bodies including male/female ratio etc* |
| **Human rights: strategy and management** | |
| HR1: | Description of polices, guidelines, corporate structure, and procedures to deal with all aspects of human rights |

**Table 2.1 (Continued)**
***Global Reporting Initiative (GRI) Index***

| Core indicators | Description |
|---|---|
| SOCIAL | |
| **Human rights: strategy and management** | |
| HR2: | Evidence of consideration of human rights impacts as part of investment and procurement decision |
| HR3: | Description of policies and procedures to evaluate and address human rights performance within the supply chain and contracts |
| **Human rights: policies/procedures and management systems** | |
| HR4: | Discrimination |
| HR5: | Freedom of association |
| HR6: | Child labour |
| HR7: | Forced and compulsory labour |
| **Society: policies/procedures and management systems** | |
| SO1: | Impact of operation on community |
| SO2: | Bribery and corruption |
| SO3: | Political lobbying and contribution |
| **Product responsibility: Policies/ procedures and management systems** | |
| PR1: | |
| PR2: | Customer health and safety |
| PR3: | Product information and labelling<br>Consumer privacy |

* This item (LA11) was excluded from the index, as this is not a voluntary disclosure item; it is required to be provided to the Australian Stock Exchange under Listing Rules 4.10.3 and 12.7.

**Item Excluded from the Index**

For this study, 39 indicators will be considered with one indicator being excluded, as it is not considered voluntary in Australia. The indicator excluded is core social labour: diversity and opportunity LA11: Composition of senior management and corporate governance bodies, including male and female ratios. This item is not considered voluntary because it forms part of the Australian Stock Exchange (ASX) Listing Rules 4.10.3 and 12.7. Under listing rule 4.10.3 companies are to disclose in annual report their corporate governance policies, the extent of compliance to this rule and if not compliant reasons as to why not. Under listing rule 12.7 all top 500 companies are required to have an audit committee; top 300 companies are also required to comply with the Corporate Governance Recommendation in relation to composition, operation and responsibility of the audit committee (Recommendation 4.2, 4.3 and 4.4); and all other entities are required to comply with ASX listing rule 4.10.3. Since these rules may be applicable for some companies in the sample, this indicator cannot be considered voluntary is therefore excluded from the list of forty indicators.

**Criticism of the Global Reporting Initiative (GRI) Index**

Whist the Global Reporting Initiative (GRI) guidelines have many supporters, it is subject to criticism. This is due to the variation that exists in how companies report. According to SustainAbility (2002, p. 17) "The GRI Guidelines themselves allow companies partially off the hook. A company can be GRI compliant whilst looking at the least impactful aspect of their business, GRI needs to be increasingly vigilant of company abuse of the guidelines or process-claiming their reporting is in Accordance when it is not; incomplete, inaccurate, misleading or inappropriate." This view is also supported in other studies. For example, Frost et al. (2005a) and Rarr (2002) noted that the reports were incomplete, inaccurate, and often biased in which items they chose to disclose. These weaknesses in the GRI reporting framework can be directly linked to the fact that the guidelines are voluntary and companies are not obliged to report on items they may not want to disclose. As such, the company disclosures may be subject to bias.

**Other Sustainability Indexes**

The Global Reporting Initiative (GRI) Index is not the only sustainability index, however it was selected for this study as it has been identified as the preferred index for companies reporting sustainability information (KPMG Survey into Corporate Social Responsibility, 2005; Frost et al. 2005a; Australian Government Department of the Environment and Heritage, 2005: and Australian Government Department of the Environment and Heritage, 2004). In addition, all sustainability indexes are subject to the previously mentioned weakness as all are voluntary, making the GRI index the preferred index for this study. Some of the other sustainability indexes include Davis-Walling & Betterman, Deloitte Touche Tohmatsu, UNEP-Sustainability and ISO 14031.

The Davis-Walling and Betterman sustainability system requires user to disclose information on corporate policies and investments, regulatory requirements pollution prevention, community involvement, employee involvement and miscellaneous such as awards and ecology (Morhardt, Baird and Freeman, 2002). The Deloitte Touche Tohmatsu systems consists of providing information on corporate profile, report design, environmental impact, environmental management, communication and stakeholder relations (Morhardt et al. 2002). The UNEP-Sustainability systems requires provision of information relating to management policies and systems, inputs and outputs, stakeholder relations and partnerships and sustainable development (Morhardt et al. 2002). Another commonly used system is the ISO 14031. This system requires organisations to provide general information such as environmental interest, potentially interested parties, management performance indicators such implementation of polices and programs, operational performance indicators such as material and energy and environmental condition indicators such as air, water and land (Morhardt et al. 2002). Whilst these systems are in existence, the most commonly used and most comprehensive is the GRI index and that is why this index was selected to be used for this study in preference to other sustainability indexes.

**Summary**

This chapter has presented the Global Reporting Initiative (GRI) index, by outlining the need for a sustainability index, discussing the development of the GRI index and use of the index, describing the environmental and social components of the index, identifying the criticism to the index. In addition, this chapter has also identified other sustainability indexes introduced to make sustainability reporting more standard. The next chapter will focus on the relevant literature on sustainability, including relevant and recent studies on the extent and type of sustainability reporting, characteristics of companies reporting sustainability information and other studies in sustainability.

# CHAPTER 3
# LITERATURE REVIEW

## Introduction

Over the last decade or so there has been a trend towards reporting of non-financial performances by many organisations within their annual reports (Deegan, 2003). The first type of non-financial information to be reported on was environmental performance, followed by the information regarding the organisations corporate social responsibility and now the trend has emerged towards reporting on what is called sustainability. The trend towards sustainability reporting is recent and there has been very little research in this area. Most studies in this area have been about identifying the increase in this type of reporting and no study has been able to explain the occurrence of this type of reporting.

Several definitions have been used in literature to define sustainability reporting. The most commonly referred definition is that provide in Brundtland Report (1987). Brundland Report in Deegan (2003, p. 948) defined sustainability as "a development that meets the needs of the present world without compromising the ability of future generations to meet their own needs". According to Deegan's view (2003, p. 948-949) sustainable organisations are those organisations that are "long term perspective, financially secure, have minimum negative environmental impact and act in conformity with the expectations of the society". Based on the Rarr (2002) definition, sustainability reporting means reporting on three perspectives of economic, environmental and social performance, this is also known as triple bottom line reporting.

Whilst there has been little research into identifying why organisations report on sustainability several studies have looked at the extent and type of sustainability reporting including KPMG Survey into Corporate Social Responsibility (2005); The Australian Government Department of the Environment and Heritage (2005); The Australian Government Department of the Environment and Heritage (2004); Kolk

(2005); Kolk (2004); Kolk (2003) and Frost, Jones, Loftus and Lann (2005a). The only study that has looked at the characteristics of companies reporting sustainability information was by Frost et al. (2005a). Other studies on sustainability have looked at general sustainability reporting and reporting of sustainability information in standalone sustainability reports.

**Recent and Relevant Studies on Sustainability**

*The Extent and Type of Sustainability Reporting*

The KPMG Survey into Corporate Social Responsibility (2005) found that sustainability reporting had increased since 2002 with economic (74%) and ethical considerations (53%) being the key drivers. Other motivating factors included innovation and learning (53%), employee motivation (47%), risk management or risk reduction (47%), access to capital or increased share value (39%), brand reputation (27%), market position improvement (21), strengthened supplier relationship (13%), cost savings (9%), improved relationship with government authorities (9%) and other (11%).

The survey consisted of top 250 companies of the Global Fortune (G250) and top 100 (N100) companies in each of the following countries: Australia, Belgium, Canada, Denmark, Finland, France, Germany, Japan, Netherlands, Norway, South Africa, Spain, Sweden, UK and USA. The information was collected for the 2003/2004 financial year and companies that provided separate sustainability reports and sustainability sections within their annual reports were considered.

They found that the GRI index was the most commonly used format with 40% of companies choosing to report sustainability using GRI index. The level of reporting differed between the G250 and the N100 companies, with G250 companies reporting more than the N100. The reporting across countries also differed, with Japan and UK leading the way in sustainability reporting. The level of reporting also differed across the sectors. In G250 companies the sectors reporting the most were finance, securities and insurance, electronics and computers and automotive. In the N100 finance, securities and

insurance sector also reported the most followed by the trade and retail sector and utilities. The survey also found that the major accountancy firms consisting of PricewaterhouseCoopers, KPMG, Ernst & Young and Deloitte (big four) dominated the assurance market with 58% of sustainability information being audited by these firms.

Kolk's (2005) study on voluntary disclosure found a significant rise in Japan and Europe in sustainability reporting amongst multinational companies. Approximately half of the companies in this study disclosed information on sustainability. Out of those, one third of the reports were also externally verified. It was also noted that differentiation existed on sustainability disclosures between countries with Europe and Japan rating highest.

The Australian Government Department of the Environment and Heritage (2005) study included 486 companies and consisted of companies listed on S&S/ASX 300 index, top 100 private companies and top 100 unlisted public companies. Companies in the sample were sent out a questionnaire with examination of their websites also being carried out. Triple bottom line reports, environmental reports and community reports were all considered to be sustainability reports, both standalone and sustainability information provided in annual reports were also considered.

The response rate was 28%, 76 companies provided their sustainability information whilst 62 companies elected not to provide their sustainability information. The findings indicated that 61% of 76 companies that elected to provide their sustainability information were providing sustainability reports, 24% of the total companies (486) were producing sustainability reports.

The findings also indicate an increase in sustainability reports. Most companies providing sustainability information were disclosing this information within their standalone reports as opposed to annual reports. It was also noted that 55% of 76 companies providing sustainability information were from mining and manufacturing industries and highest rate of sustainability reporting (46%) was by foreign owned proprietary companies.

The study by the Australian Government Department of the Environment and Heritage (2004) also found similar results. Out of 509 companies in their study 23% reported on sustainability by providing standalone reports, information within their annual reports or on their websites.

Standalone reports were the most commonly used in providing information on sustainability, with 73% of companies disclosing their sustainability information in these reports. Annual reports were used by 18% of companies and 9% used their websites to report this information. The percentage of sustainability reporting and verification had increased. Although the increase in external verification was mostly for standalone reports and only few companies obtained verification for sustainability information within the annual reports and the websites.

Mining and manufacturing companies provided the most information with 58% reporting on sustainability. Foreign owned companies were also more likely to report on sustainability than those that were Australian owned. Companies listed on the S&P/ASX reported the most with 36.2%, followed by public non-listed that are foreign-owned (30.2%), propriety that are foreign-owned, public non-listed that are Australian (4.3%) and proprietary that are Australian (1.7%). Out of the 509 companies, researched 40 used the GRI reporting index.

The studies outlined in this section whilst providing valuable information on extent and type of sustainability reporting did not attempt to explain the level of voluntary sustainability disclosures. These studies looked at top 500 companies and not all companies, thus results may be biased towards larger companies. This is problematic considering that financial regulators in Australian are currently considering introducing a standard on sustainability. Compliance with the new sustainability standard would most likely be required for all companies providing annual reports, thus regulators need more information on voluntary sustainability reporting by Australian companies and not just top 500 companies. In addition, through the use of content analysis a wider sample could have been considered.

*Characteristics of Companies Reporting Sustainability Information*

The only study to look at the characteristics of companies reporting sustainability information was by Frost et al. (2005a). The study consisted of three parts. In the first part, they surveyed the current sustainability practices and found that only 24 out of top 500 Australian listed companies published a discrete report on sustainability. Out of those 24 companies, reporting on sustainability the information provided was extremely biased and focused on the positives with negative information receiving little if any attention, 54% of these companies had some form of audit or assurance statement attached to it. This research also found that there was lack of reporting framework used, absence of audit with many of the reports, larger companies tended to report more on the triple bottom line and companies that operated in certain sectors such as capital goods and material industries were more likely to provide voluntary sustainability information. Those companies that followed a reporting framework used the GRI guidelines.

In the second part they looked at the 24 companies identified in part one and compared these to all the companies listed on the ASX, and also to the top 100 and 300 listed firms ranked by market capitalisation. They compared various ratios and found that the sample companies had exceptional performance based on rate on return measures, cash flow performance, gearing, debt servicing, and valuation multiples. However, it should be noted that specific industries such as the capital goods and material industries and larger firms dominated the sample.

In the third part of the study, they developed a method for ranking the top ASX 100 listed Australian companies by using the Global Reporting (GRI) indicators to identify the level of reporting on sustainability. They also compared the index scores with the financial and market characteristics in order to explain the link between the level of reporting and the company's performance. In addition, they attempted to link other performance measures such as market-adjusted returns and distress probabilities. The results indicated a negative association between sustainability disclosures and market adjusted returns, strong relationship existed between the level of disclosure and operating cash flow to assets, working capital to assets, retained earnings to assets, assets

backing per share, debt service capacity and capital expenditure. There was a negative association between sustainability disclosures and cash resources to total assets and the price to book value ratios. The correlation between the distress probabilities and the level of sustainability indicated a significant negative relationship.

Whilst this study was extensive and provided various useful information on the level of voluntary sustainability disclosure it did not apply any theoretical framework, nor did it develop hypotheses to attempt explaining why those specific outcomes were occurring. The study simply used all ratios and tried to explain which were and which were not associated with voluntary disclosure of sustainability information. It provided no reasons as to why certain variables where associated with voluntary disclosure whilst others were not. Because the study consisted of top 500 Australian listed companies the results may be biased towards large companies and therefore the results may not be representative of all Australian listed companies. The limitation of this study provides direction to future studies on voluntary sustainability disclosures.

**Table 3.1**
***Summary of Most Recent and Relevant Studies***

| Researcher(s) | Research method | Major findings |
|---|---|---|
| KPMG Survey into Corporate Social Responsibility (2005) | The survey included top 250 Global Fortune (G250) and top 100 (N100) companies In: Australia, Belgium, UK, Canada, Denmark, Spain, Finland, France, Japan, Germany, Sweden, Netherlands, Norway, USA and South Africa.<br><br>Information was collected for 2003/2004 financial year.<br><br>Sustainability reports and sections within annual reports were considered. | GRI index was most commonly used (40%) used format.<br><br>The level of reporting differed between the G250 and the N100 companies, with G250 companies reporting more.<br><br>Reporting across countries also differed, with Japan and UK leading the way in sustainability reporting.<br><br>In G250 companies the sectors reporting the most were finance, securities and insurance, electronics and computers and automotive.<br><br>In the N100 finance, securities and insurance sector also reported the most followed by the trade and retail sector and utilities.<br><br>Major accountancy firms including KPMG, Deloitte, Ernst and Young and PricewaterhouseCoopers dominated the assurance market. |

**Table 3.1 (Continued)**
***Summary of Most Recent and Relevant Studies***

| Researcher(s) | Research method | Major findings |
|---|---|---|
| Australian Government Department of Environment and Heritage (2005) | Questionnaire and content analysis was performed on 486 companies. Sample consisted of companies listed on S&S/ASX 300 index, top 100 private companies and top 100 unlisted public companies.<br><br>Examination of company websites also carried out.<br><br>Triple bottom line reports, environmental reports ane community reports were all considered to be sustainability reports, both standalone and sustainability information provided in annual reports were considered.<br><br>The response rate was 28%. Out of those 76 elected to provide their sustainability information whilst 62 companies elected not. | The findings indicated that 61% of 76 companies that elected to provide their sustainability information were providing sustainability reports, 24% of the total companies 486 were producing sustainability reports.<br><br>The findings also indicate an increase in sustainability reports.<br><br>Most companies providing sustainability information were disclosing this information within their standalone reports as opposed to annual reports.<br><br>55% of 76 companies providing sustainability information were from mining and manufacturing industries and highest rate of sustainability reporting (46%) was disclosed by foreign owned proprietary companies. |

**Table 3.1 (Continued)**
***Summary of Most Recent and Relevant Studies***

| Researcher(s) | Research method | Major findings |
|---|---|---|
| Australian Government Department of Environment and Heritage (2004) | Questionnaire and content analysis were used for 509 companies, sample consisted of companies listed on S&S/ASX index, top 100 private companies and top 100 unlisted public companies. | Standalone reports were the most common, (73%). Annual reports were used by 18% of companies and 9% used their websites to disclose information. |
| | | Increase in reporting and external verification. External verification was mostly for standalone reports. |
| | Triple bottom line reports, environmental reports ane community reports were all considered to be sustainability reports, both standalone and sustainability information provided in annual reports were considered. | Mining and manufacturing companies provided the most information (58%). Foreign owned companies provide more then Australian owned. Those listed on the S&P/ASX reported the most with 36.2%, followed by public non-listed that are foreign-owned (30.2%), propriety that are foreign-owned, public non-listed that are Australian (4.3%) and proprietary that are Australian (1.7%). |
| | | Out of the 509 companies, researched 40 used the GRI reporting index. |

**Table 3.1 (Continued)**
***Summary of Most Recent and Relevant Studies***

| Researcher(s) | Research method | Major findings |
|---|---|---|
| Kolk (2005) | All the Triad companies in the Global Fortune (first 250) as published on 3 August 1998, all that survived into 2002 were included (n = 203) | Between 1999- 2002 period significant rise in sustainability reporting for Japan and Europe amongst multinational companies. In US, sustainability reporting stabilised. |
| | The sample included 72 companies from USA, 52 from Japan and 79 from Europe. | Approximately half of the companies in the study disclosed information on sustainability. |
| | Data was collected for 1998/1999 & 2001/2002 financial years. All companies in sample were requested to provide environmental, social, sustainability or annual reports. | Out of those, one third of the reports were also externally verified.<br><br>It was also noted in this study that clear differentiation existed between countries. Countries in Europe and Japan rated the highest in terms of provision of this information. |
| | Quantitative analysis was performed on the reports, and the dichotomous scale was used to score. Logistic regression was used. | |

**Table 3.1 (Continued)**
***Summary of Most Recent and Relevant Studies***

| Researcher(s) | Research method | Major findings |
|---|---|---|
| Frost et al. (2005a) | Surveyed the current sustainability practices of top 500 Australian companies. | Found that only 24 out of top 500 Australian listed companies published a discrete report on sustainability. |
| | They compared various ratios of the 24 companies to the rest. | Those companies that followed a reporting framework used the GRI guidelines. |
| | They ranking the top ASX 100 listed Australian companies by using the Global Reporting indicators to identify the level of reporting on sustainability. | They found that the 24 companies reporting on sustainability had exceptional performance based on rate on return measures, cash flow performance, gearing, debt servicing, and valuation multiples. |
| | They also compared the index scores with the financial and market characteristics in order to explain the link between the level of reporting and the company's performance. | The results indicated a negative association between sustainability disclosures and market adjusted returns, strong relationship existed between the level of disclosure and operating cash flow to assets.<br><br>There was also negative association between sustainability disclosures and other ratios used. |

**Other Studies**

*Motivation for Disclosure*

In Kolk (2004) article the companies' motivation for reporting and not reporting were identified. According to Kolk (2004), Sustainability and UNEP (1998) undertook research into the motivation of companies to disclose sustainability information. They interviewed a number of companies in London and found a number of factors influenced whether a company choose to disclose sustainability information voluntarily.

Three of the main reasons for reporting on sustainability were to enhance ability to track progress against specific targets, to have greater awareness of broad environmental issues throughout the organisations and to facilitate the implementation of the environmental strategy. For some companies it was the ability to clearly convey the corporate message internally and externally, ability to communicate efforts and standards and improved all-round credibility that influenced them to report on sustainability. For other companies it was the reputation benefits, cost savings, identification, increased efficiency, enhanced business development opportunities and enhanced staff morale that were influencing factors in whether they reported on sustainability.

Reasons for not reporting included doubts over the advantage that it would bring to the organisation. Some companies claimed that customers are not interested in sustainability reporting, reporting will not increase sales, competitors neither publish sustainability reports. Other companies stated that there were many other ways of communicating about environmental issues. Some companies also thought that they already had a good reputation for their environmental performance and reporting will not make any difference. For other companies it was too expensive to report and some thought that reporting on these matters could damage the reputation of their company.

Whilst this study provides possible reasons as to why companies might be disclosing sustainability information, it did not look at the actual disclosures, or at the characteristics of companies that disclosed. The study was also limited because interview was undertaken as a method of collecting information; a wider sample could have been

reached using another method, such as questionnaire. The present study is different because both actual disclosures as well as the characteristics of companies disclosing will be considered, thus users and regulators will be provided with more information.

*Standalone Sustainability Reports*

There have been other studies in terms of sustainability reporting, however these studies are different to this research and thus their importance to this study is not directly significant. Studies in this section have been either about standalone sustainability reports or sustainability reporting in general but not specific enough for this study.

As discussed in the first chapter this study is only concerned with voluntary sustainability reporting in annual reports. As such, studies on standalone sustainability reports are not highly important to this study because they are considered completely different. Standalone sustainability reports are prepared for presenting sustainability information, thus companies that prepare these types of reports are likely to be different to most companies and are likely to report their sustainability information in those reports. Whilst these studies are not directly important, they should nonetheless be briefly covered as they do provide some information on voluntary sustainability reporting. Research on standalone sustainability reports includes studies by Rarr (2002) and Morhard, Barid and Freeman (2002).

A study by Rarr (2002), investigated the quality and quantity of voluntary environmental disclosures in annual reports and environmental reports of companies. The sample consisted of 425 annual reports and 60 environmental reports of companies listed on Australian Stock Exchange (ASX) by market capitalisation. The periods looked at were those prior to the release of the Global Reporting Initiative (GRI) guidelines. The findings of the study indicated a trend towards triple bottom line reporting and change to the quality and quantity of environmental information in some categories.

Morhardt et al. (2002) undertook a study to examine different sustainability indexes. They scored corporate voluntary reports using different scoring systems to determine if the level of voluntary sustainability reporting varied when a different scoring method was applied. They applied two scoring methods of Global Reporting Initiative GRI 2000 and ISO 14031 and discovered that the level of sustainability reporting was considerably low when using these two scoring methods. A large number of corporate voluntary reports scored below the standards as indicated in GRI and ISO 14031.

Both of these studies indicated that there was a trend towards sustainability reporting. Rarr (2002) study prior to the introduction of the Global Reporting Initiative indicated that there was a trend towards this type of reporting. Morhardt et al. (2002) found that although companies were reporting on sustainability using the two scoring methods indicated the companies were disclosing very little information. Whist these results provided information on trends in reporting they did not do more, thus resulting in a number of research gaps. Firstly, the Rarr (2002) study looked at sustainability prior to the introduction of the Global Reporting Initiative (GRI) indicating a gap in research as this information does not reflect the current practices but rather past practices. Morhardt et al. (2002) only looked at the sustainability reports and did not look at annual reports.

Other Research

There have been other studies that are significantly different to this project, however they too have looked at sustainability and should therefore be mentioned. Adams (2004) looked at the actual performance of company and compared to the reported performance. Sullivan (2002) looked at sustainability reports and their usefulness. Slater and Gilbert (2004) looked at the usefulness of these reports to the investor. Tilt (2001) considered whether corporate environmental policies played a role in what information was disclosed.

Adams (2004) compared the actual sustainability performance of company Alpha to its reported performance. The study found that the actual and reported performances

differed significantly. In this study, Adams (2004) compared the reported ethical, social and environmental performance in Alphas annual report to their performance from other sources. The major concern identified was the "lack of completeness" in reports as Alpha Company often failed to include unfavourable information in their reports.

A study by Sullivan (2002) also found that the current reports lacked consistency in information and data collection and therefore lacked credibility and comparability. Slater and Gilbert (2004) suggest that this type of information is proving useless for investors, as investors are often forced to make decisions based on an incomplete picture of the organisations. They point out that quality sustainability reports could help investors make better decisions by differentiating those companies that are efficient and positioned well in their market from those that are bound to fail.

Tilt (2001) examined whether corporate environmental policies play a part in how and what information is disclosed and found that environmental policies in Australia contained little information on reporting standards of disclosure. Adams (2004) has argued the need for mandatory sustainability reporting especially for multinational companies. Deegan (2001) has proposed that should sustainability reporting become mandatory this would affect the accountability of management on environmental and social performance and smaller companies ability to meet the required cost. Deegan's concern indicates that more research needs to be done for all companies not just large companies.

**Summary**

Most studies in sustainability have been about identifying the current trends in reporting rather then explaining why companies report sustainability. Trends in sustainability include increased reporting, verification and use of the GRI guidelines. These studies have also identified differences in reporting between countries, sectors, size and other factors. The only study to attempt explaining the growing trend in sustainability reporting was by Frost et al. (2005a). However, no clear conclusions could be reached from this study because no theoretical framework was employed.

Previous studies whilst contributing to research in this area have not used a theoretical framework to explain sustainability reporting, thus this is evidence of the research gap in this area. Also previous studies only considered the top 500 companies by market capitalisation and therefore there is a bias towards larger companies. To a wider sample size, this study will attempt to explain the occurrences of sustainability reporting using a theoretical framework.

This chapter has discussed the current and relevant literature on sustainability, including studies on the extent and type of sustainability reporting and characteristics of companies reporting sustainability information and identified a research gap. In addition, it also considered other studies in sustainability that are not directly related to this study but have provided some valuable information in this area. The next chapter will focus on the theoretical framework of positive accounting and development of the hypotheses for the study.

# CHAPTER 4
# THEORETICAL FRAMEWORK AND HYPOTHESES

## Introduction

This chapter has two objectives. The first objective is to present the theoretical framework and describe aspects of the positive accounting theory. The second objective is to present the development of hypotheses relating to the theoretical framework and the review of literature in chapter three. The six testable hypotheses presented in this chapter relate positive accounting theory with separation of ownership and control, leverage, big four audit firm, size of the firm, profitability and industry.

## Positive Accounting Theory

Positive accounting theory framework is employed to explain why some organisations choose to disclosure voluntary information on sustainability. In positive accounting theory the firm consists of a number of agency relationships between suppliers of equity, debt, providers of products and human capital (Whittered and Zimmer, 1986). According to Jensen and Meckling (1976, p. 308) an agency relationship is a "contract under which one or more person engage another person to perform some service on their behalf which involves delegating some decision making authority to the agents". In firms the shareholders are the principal, and are not involved in daily operation of the firm, the agent (the manager) is delegated decision making powers for daily operations.

The theory takes on the assumption that all individuals are self-interested with the objective of acting for their own benefits; these are sometimes disguised as benefits for others (Deegan, 2003). Based on this theory management are likely to adopt policies which best reflect on the performance of the firm. In the case of voluntary disclosure, management might select this policy to show the firms performance and the value added. In turn to maximise their own benefits or to reduce the future costs of the firm.

In positive accounting theory two types of costs are considered, agency and political costs. Agency costs are those costs resulting from delegating the process of decision making from the owners to the management (agency relationship). Because the principal (owner) is aware of the agency cost, the principal tries to monitor the agent through for example preparation of annual reports. Due to the monitoring by the principal, the agent bonds to the interest of the principal and thus acts in the principal's best interest Henderson, Peirson and Harris (2004). However due to the opportunistic nature of an agent, the agent will never completely bond to the interest of the principal.

Acting in the best interest of the principal means that management of companies under agency pressures will adopt policies that decrease their agency costs. For example management will select accounting policies which best reflect performance of the firm, thus by maximising user value the agents remuneration or reputation might be enhanced Henderson et al. (2004). In the case of voluntary disclosure of sustainability information management may elect to disclose this additional information to add value to the firm, to indicate that the company is performing well socially. By doing this the firms reputation might be enhanced, thus as the firms reputation enhances so does the reputation of the management running the firm. In this case, the agent whilst it may look to be acting in the firm's best interest is also acting in the best interest of the agent.

Political costs are those costs that may be imposed on the company from society because of particular political actions such as cost associated with increased taxes, increased wage claims or product boycotts (Watts and Zimmerman, 1986). The political-cost hypothesis predicts that companies under political pressure will adopt policies that decrease their political costs (Deegan, 2003). Ness and Mirza (1991) investigated this in the case of voluntary disclosure in United Kingdom. They argued that certain industries such as oil industry had poor environmental performance and could be affected by environmental regulation or increased tax which would decrease their profits, to avoid these situations these companies are likely to voluntarily disclose their environmental performance (Ness and Mirza, 1991).

Positive accounting theory is suitable for this study because "it is designed to explain and predict which firms will and which firms will not use a particular (accounting) method," Watts and Zimmerman (1986, p.7). The aim of this study is to use variables from positive accounting theory as well as the review of literature to explain which firms will and which firms will not choose the accounting method of voluntarily disclosing sustainability information. This theoretical framework has not been used in prior studies on voluntary sustainability reporting per se. However it has been used in other areas of voluntary disclosure including segment reporting, lease disclosures, value added statement, interim reports and cash-flow statements (McKinnon and Dalimunthe, 1993; Bazley et al. 1985; Gray et al. 1993; Leftwich, Watts and Zimmerman, 1981; and Hassan, 1994).

**Hypotheses Development**

The following sections discuss the formulation of each of the hypothesis to be tested in this study. The hypotheses are developed based on positive accounting framework and the review of the literature. All hypotheses designed are directional and are related to agency and political costs of separation of ownership, leverage, audit by big four firm, size of the firm, profitability and industry type. The following hypotheses were developed to test the relationship between voluntary sustainability disclosure and selected organisational characteristics:

*Separation of Ownership and Control (OWN)*

It is hypothesised that companies with widely held shareholdings are more likely to provide more voluntary sustainability information within their annual reports than those companies with closely held shareholdings. This is due to the greater separation of decision-making that exists when companies have widely held shareholdings (Craswell and Taylor, 1992; Jensen and Meckling, 1976; Roberts, 1992).

In these cases, the agency costs are higher because the agent has greater decision-making powers. The agents behaviours are monitored by the principal and this results in the

agent (management) bonding to the interests of the principal. This means that the agent will act in the interest of the principal. For this reason, it expected that the management would elect accounting policy choices that will reduce the agency cost. One such choice is providing the principal with additional information on sustainability performance. By providing the information the agent is disclosing decision made on the principals behalf, thus adding value to the service the agent provides to the principal.

In this hypothesis widely held shareholdings are indicated where a high percentage of ordinary shares are held by other then the top twenty shareholders. Annual reports are the format through which owners can monitor the manager's performance and so the management is likely to provide the necessary information to demonstrate their performance (Craswell and Taylor, 1992). The following hypothesis is tested to determine if widely held shareholdings increase the level of voluntary sustainability reporting in annual reports:

H1: The extent of voluntary sustainability disclosure in the annual report of Australian listed public companies is positively associated to ownership diffusion.

*Leverage (LEV)*

It is hypothesised that companies with high leverage ratios are more likely to disclose voluntary information on sustainability within their annual reports. This is also due to the separation of decision making relating to the management of funds provided by lenders. The agency cost of debt arises because of the separation between lenders and the management (Henderson et al. 2004).

In cases where company's have higher debt ratios the agency costs of debt may be higher because the agent has decision making powers in relation to more funds. To minimise the agency costs of debt lenders may impose restrictions on the agents. Due to these restrictions, the agents are likely to bond to the interest of the lenders. In bonding to the

interests of lenders, management may elect accounting policy choices that will reduce the agency cost of debt. One such choice is providing the lenders with additional information on sustainability performance. By providing the information the agent is disclosing decision made on the lenders funds, thus adding value to the service the agent provides to the lender. In addition when the leverage increases the lenders are likely to demand more information from the management and thus to satisfy the lenders management are likely to provide more voluntary information (Deegan, 2003).

The leverage ratio can be calculated in a number of ways. For this hypothesis, the leverage ratio determined will be debt to total assets. Again, the annual reports are the format through which this information can be communicated (Craswell and Taylor, 1992). Bradbury (1992) found strong association between the voluntary segment disclosure and leverage. Bazley et al. (1985), Gray et al. (1993) and Leftwich et al. (1981) found moderate relationship between the voluntary disclosure of lease, value-added statements and interim reports to the leverage. McKinnon and Dalimunthe (1993) found no significant relationship between leverage and voluntary disclosure of segments. The following hypothesis is tested to determine if high leverage ratios increases the level of voluntary sustainability reporting in annual reports:

H2: The extent of voluntary sustainability disclosure in the annual report of Australian listed public companies is positively associated to financial leverage.

*Big Four Audit Firms (BFAF)*

Although not many previous studies have linked the audit of big four firms to voluntary disclosure. Prior studies by Watts and Zimmer (1986), Singhvi and Desai (1971) and Craswell and Taylor (1992) found that larger audit firms had significant association with voluntary disclosure. According to Craswell and Taylor (1992) large firms fear loosing their reputation and encourage more disclosure. The KPMG (2005) survey also noted that the big accountancy firms dominated the assurance market with 58% of sustainability information being audited by these firms. For this reason, it is

hypothesised that companies that voluntarily disclose sustainability information in annual reports are positively associated with audit by a big four-audit.

This is due to the separation of decision-making that exists when companies are not controlled by the principal. The agents behaviours are monitored by the principal and this results in the agent (management) bonding to the interests of the principal. This means that the agent will act in the interest of the principal. To reduce the agency cost the principal may elect to monitor the agent's performance by demanding audit reports, however this means that the company will incur monitoring costs. In order to satisfy the principal the agent is likely to bond with the principal by providing an audit report.

Furthermore, management will elect accounting policy choices that will reduce the agency cost. One such choice is providing the principal with additional information on sustainability performance. By providing the information the agent is disclosing decision made on the principals behalf, thus adding value to the service the agent provides to the principal. In doing so, the agent is likely to use one of the big four audit firms as these firms have more resources and expertise. In addition, good quality external audits safeguard and enhance credibility of financial reports (Ball, Kothari and Robin, 2000; and Choi and Wong, 2002). Agents are expected to choose firms with more resources and expertise to provide evidence to owners that the information is credible. Teoh and Wong (1993) have also documented that big audit firms provide better quality service.

Globally and in Australia, the big four audit firms include KPMG, PricewaterhouseCoopers, Ernst & Young and Deloitte Touche Tohmatsu. The following hypothesis is tested to determine if audit by a big four-audit firm influences the company's voluntary sustainability disclosure in annual reports:

H3: The extent of voluntary sustainability disclosure in the annual report of Australian listed public companies is positively associated audit by a big four audit firm.

*Size of the Firm (SIZE)*

It is hypothesised that larger companies are more likely to voluntarily disclose sustainability information in their annual reports then smaller companies. This is due to the political cost that may arise when a company is large. The larger the size of the company the more visible the company becomes to the political pressures (Deegan, 2003; Panchapakesan and McKinnon, 1992; Wong, 1988). From positive accounting theory the political-cost hypothesis predicts that companies under political pressure will adopt policies that decrease their political costs (Watts and Zimmerman, 1986). To avoid these political costs the management is more likely to provide additional voluntary sustainability information.

Studies by Spicer (1978), Trotman and Bradley (1981), Kelly (1981), Frost et al. (2005a), KPMG (2005) and Australian Government Department of the Environment and Heritage (2004) all found the firm's size was an influencing variable as larger companies tended to provide more voluntary information than smaller companies.

For this hypothesis two alternative definitions are employed. The size of the firm is calculated first by market capitalisation (closing share price on the last day of company's financial year multiplied by number of ordinary shares outstanding at the end of the period) and second by the reported net profit after tax before abnormal after tax and less outside equity interests and preference dividends. The following hypothesis is tested to determine if the size of the company influences the level of voluntary sustainability disclosure in annual reports:

H4: The extent of voluntary sustainability disclosure in the annual report of Australian listed public companies is positively associated to firm size.

*Profitability (PROF)*

It is hypothesised that companies that voluntarily disclose sustainability information in their annual reports are likely to have higher profitability ratios. This is due to the political cost that may arise when a company is profitable. The more profitable the company the more they become visible to the political pressure (Deegan, 2003; Godfrey and Jones, 1999). From positive accounting theory the political-cost hypothesis predicts that companies under political pressure will adopt policies that decrease their political costs (Watts and Zimmerman, 1986). To avoid these political costs management is likely to voluntarily disclose additional sustainability information.

Frost et al. (2005a) found a positive link between those companies that provided voluntary sustainability information and their performance. For this hypothesis, the firm's profitability is calculated by earnings before interest and tax divided by operating revenue. The following hypothesis is tested to determine if there is a link between the company's profitability and the voluntary sustainability disclosure in annual reports:

H5: The extent of voluntary sustainability disclosure in the annual report of Australian listed public companies is positively associated to profitability.

*Industry Type (INDT)*

It is hypothesised that companies that voluntarily disclose sustainability information in their annual reports are likely to be from materials, industrials and energy sectors. This is due to the political cost that may arise when a company is from one of those industries. Due to the nature of their work, certain industries are more likely to be visible to political pressure, and these include the materials, industrials and energy sectors (Deegan, 2003). From positive accounting theory the political-cost hypothesis predicts that companies under political pressures will adopt policies that decrease their political costs (Watts and Zimmerman, 1986).

Hackston and Milne (1996) found that high profile industries tended to disclose more information. Ness and Mirza (1999) found that companies from oil industry disclosed more information on their environmental performance. Kelly (1981) also found that operating environment and the industry played a role in voluntary disclosure. KPMG Study (2005) found that for the G250 companies the finance, securities and insurance, electronics and computers and automotive sectors disclosed more than other sectors. This same study found that for N100 companies' finance, securities and insurance sector reported the most. Contrastingly Frost et al. (2005a) found that materials, capital goods and energy sectors disclosed more information than other sectors.

For this hypothesis all sectors that are not materials, industrials and energy sectors are considered other sectors. The following hypothesis is tested to determine if companies in the materials, industrials and energy sectors are likely to disclose more voluntarily sustainability information in their annual reports then companies from other sectors:

H6: The extent of voluntary sustainability disclosure in the annual report of Australian listed public companies is positively associated to materials, industrials and energy sectors.

**Summary**

This chapter has presented the theoretical framework and described aspect of the positive accounting theory. This chapter has also described the development of six testable hypotheses relating to the theoretical framework and review of literature including; separation of ownership and control, leverage, big four audit firm, size of the firm, profitability and industry type. The next chapter of this thesis will detail the research methodology employed for this study. This will include discussing the research design, population, sample, data collection and recording method, variable definition and data analysis. All variables are designed to test the six hypothesis presented in this chapter.

# CHAPTER 5
# RESEARCH METHODOLOGY

## Introduction

The objective of this chapter is to outline the research methodology employed for the study as presented in previous chapters: introduction, sustainability index, literature review, theoretical framework and hypotheses development. This chapter will discuss and present the research design of the study, population of the study, sample selection, data collection and recording method undertaken, variable definition employed and the approach to data analysis for the study.

## Research Design

This study employed the review of documents approach to analyse the contents of annual reports from the sample of companies. Annual reports were selected as the source of information because they are considered as the most important document prepared by the company and are the format through which companies are likely to communicate their sustainability information (Wiseman, 1982; Kirkham & Hope, 1992; Owen; Lewis et al., 1995 and Gibson & Guthrie, 1995).

The dependent variable is the voluntary disclosure of sustainability information (VDSI) and the independent variables are ownership diffusion, leverage, big four-audit firm, size, profitability and industry type. The first stage involved selecting a sample of annual reports and analysing its contents to determine the level and type of reporting on sustainability. The GRI index is used to measure the level and type of sustainability reporting by identifying the GRI elements reported in annual reports. The GRI index consists of forty items, of which thirty-nine were considered for this study. Refer to Chapter two for the explanation to this and Table 2.1 for the GRI summary index. The second stage involved collecting from Fin Analysis database information on the

percentage of shareholdings held by other than the top 20 shareholders, leverage, audit firm, size, profitability and industry type.

**Population**

The population for this study is the Fin Analysis database, held by the Edith Cowan University library. This database was selected over others as it provides detailed financial information for all companies listed on the Australian Stock Exchange (ASX) and is not limited to a certain number of companies as some of the other databases are. The total population of 2004[1] annual reports is 1514 (Refer to Table 5.1). The population consists of ten identifiable sectors including energy, industrials, telecommunication services, utilities, consumer staples, financials, information technology, health care, consumer discretionary and materials.

**Sample**

The sample was drawn from the population of the annual reports held on the database, Fin Analysis, at Edith Cowan University. The study is concerned with sustainability reporting across all industries and as such all industries were included in the sample. The study includes the single year of 2004 and this approach was undertaken in this instance instead of time series because the study is concerned with the most recent disclosure, available at the time of the study, as this would be of interest to users and the profession. The sample size for this study is a stratified sample of 450 annual reports (Refer to Table 5.1). Initially a systematic sample of 200 companies was extracted form a stratified list of companies, however based on the level of disclosure it became evident that the desired statistics could not be used unless the sample size was increased. To use the desired statistics the original sample was increased with a systematic selection of a further 250 companies from the stratified list of companies to provide a sample of 450

[1] The 2004 annual reports refer to the year ending 30 June 2004 or 31 December 2004.

companies. Both samples were drawn with the appropriate proportion to the population of companies in each sector. All ten identifiable industries were included in the study.

Companies with standalone sustainability reports were excluded from this study because these companies are likely to disclose their sustainability information in their standalone reports rather than the annual reports, which was the stated objective of this study. All companies selected for the sample were compared to Frost et al. (2005a) listing of companies providing standalone sustainability reports and other relevant literature for the purpose of identifying companies with standalone reports. The initial sample included five companies that provided standalone reports and these companies were systematically replaced. The five companies providing standalone sustainability reports that were excluded from the study included Amcor, Newrest Mining, Bluescope Steel, Henry Walker Eltin Group Limited and Carter Holt Harvey Limited. Refer to Appendix A for the full list of companies in the sample.

**Table 5.1**
***Population and Sample***

| Industry | Population | Sample |
|---|---|---|
| 1. Energy | 99 | 29 |
| 2. Industrials | 172 | 52 |
| 3. Telecommunication Services | 34 | 9 |
| 4. Utilities | 18 | 4 |
| 5. Consumer Stapes | 61 | 18 |
| 6. Financials | 263 | 79 |
| 7. Information Technology | 140 | 43 |
| 8. Healthcare | 142 | 43 |
| 9. Consumer Dictionary | 168 | 49 |
| 10. Materials | 417 | 124 |
| **TOTAL** | **1514** | **450** |

**Data Collection and Recording Method**

Data was collected by visually viewing the 2004 annual reports of the selected companies on the Fin Analysis database. An alternative to this data collection method would have been to use a questionnaire however, data collection from annual reports is preferred in this instance because of the inherent problems of using questionnaires (Oppenheim, 1992; and DeVellis, 1992).

The unweighted dichotomous index was used to score each company against each of the GRI indicators. An alternative to this would have been to use word or weighted index. However a dichotomous index was preferred on this instance because the study is concerned with the level of disclosure as opposed to the company's importance on disclosed items. An advantage of unweighted index is that misranking of disclosure items can be avoided (Marston and Shrives, 1991). However, a disadvantage to this index is that all items are treated equally regardless of the quality of disclosure item (Coy, Tower and Dixon, 1991). This dichotomous index has been used in prior studies on social disclosure for example in Guthrie & Mathews, 1985; Freedman & Wasley, 1990; Maheshawari, 1992.

Using the dichotomous index, those companies providing sustainability information were given a score of one for each indicator provided and a score of zero for indicators not reported. The GRI indicators were added to provide an overall score of the level of sustainability reporting by the selected companies. Further information was collected from Fin Analysis about the companies in the sample including the company name, the percentage of shareholdings held by the top 20 shareholders, leverage, profitability, size, auditor and the industry that the company belongs. This information was recorded separately for each company.

**Independent Check of Content**

Like most other data collection methods, content analysis has a weakness. According to Krippendorff (1980), a weakness in content analysis is if only one person is involved in

coding of data. To combat the weakness in using content analysis Krippendorff (1980) guidelines were undertaken. An independent person, with experience using content analysis was employed to recheck a sample of annual reports. The selected independent person was highly suited for this role having completed an Honours Degree in environmental accounting using content analysis and a Masters in voluntary disclosure of corporate governance information using content analysis and is currently undertaking further studies.

The number of annual reports verified by the independent person was 70 (15%), this amount, a stratified random sample was considered reasonable for this study. The initial results indicated that there was a small number of annual reports with variance (2%) in content analysis. This indicated a 98% agreement on the level of disclosure. After further discussions and clarifications as suggested by Krippendorf (1980) about the content analysed 100% agreement was reached on the 15% of annual reports checked. The independent check confirmed the results were not affected by the weakness in content analysis as suggested by Krippendorf (1980) for the company annual reports rechecked.

**Definition of Variables**

The dichotomous index was used to measure the dependent variable of voluntary disclosure of sustainability information. This was also used for the independent variables of big four audit firm and industry type. The dichotomous index is widely used to measure variables including in studies by Singhvi and Desai, 1971; Ness and Mirza, 1991; Kelly, 1981; Marston and Shrives, 1991; and Cooke, 1989.

The measure for the ownership diffusion was percentage of ordinary shareholdings held by other than the top twenty shareholders. This measure has been used in prior study by McKinnon and Dalimunthe (1993).The variables for size, profitability and leverage were measured as per the Fin Analysis Database. The measures used on Fin Analysis Database are commonly used. Two alternatives were used as measures of size including market capitalisation and reported net profit after tax before abnormal after tax and less outside

equity interests and preference dividends. The measure for leverage was total debt divided by total assets and the measure for profitability was earnings before interest and tax divided by operating revenue. Table 5.2 presents the variable definitions.

**Table 5.2**
***Variable Definitions***

| Variable | Expected sign | Measures |
|---|---|---|
| Dependent variable | | |
| 1. VDSI | n/a | Dichotomous index |
| Independent variables | | |
| 1. OWN | (+) | Percentage of ordinary shareholdings held by other than the top twenty shareholders |
| 2. LEV | (+) | Financial leverage: total debt divided by total assets |
| 3. BFAF | (+) | Big four audit firms (BFAF) include KPMG, PricewaterhouseCoopers, Ernst & Young and Deloitte Touch Tohmatsu: 1 = auditor, 0 = non BFAF |
| 4. SIZE | (+) | (a) Market capitalisation: closing share price on the last day of company's financial year multiplied by number of ordinary shares outstanding at the end of the period<br><br>(b) Reported net profit after tax before abnormal after tax and less outside equity interests and preference dividends |
| 5. PROF | (+) | Earnings before interest and tax divided by operating revenue |
| 6. INDT | (+) | 1 = materials or industrials or energy<br>0 = other industries |

**Data Analysis**

All data collected was analysed using computer Statistical Program for Social Science SPSS (2002). Descriptive statistics were used to analyse the level and type of sustainability reporting. This included providing information on frequency and percentage of occurrences. This method of analysing the data ensured that the first objective of measuring the level and type of sustainability reporting in companies using the Global Reporting Initiative (GRI) index was achieved. According to Barrow (1996) the main objective of descriptive statistics is to provide information in concise, clear and accurate way. Because descriptive statistics are not able to provide more then to simply describe the observed data further statistical tests were undertaken for this study.

Univariate statistics were then employed to calculate the individual means, medians, standard deviations, skewness and kurtosis of the dependent variable and all the independent variables. Pearson correlation was employed to test the relationship between the dependent variable VDSI and each of the independent variables. Applying univariate analysis prior to the multiple regression can help us determine which variables are significant on their own and which are not (Pokorny, 1991).

Ordinary least squares regression and associated tests were employed to test the hypotheses. Ordinary least square regression is useful when the independent variable is explained by multiple variables (Hair, Anderson, & Tatham, 1987). The test is related to the second objective of the study and all results are presented in the two following chapters. The model tested can be expressed as:

$$VDSI = b0 + b1\ OWN + b2\ LEV + b3\ BFAF + b4\ SIZE + b5\ PROF + b6\ INDT + ei$$

Where

| | |
|---|---|
| VDSI | is dependent variable voluntary disclosure of sustainability information |
| B0 | is a constant value |
| Bn | represents the coefficient of predictive values |
| ei | a residual value |

**Summary**

This chapter has outlined the research methodology employed for the study and included presentation of the research design of the study, population of the study, sample selected for the study, data collection and recording method undertaken, variable definition employed and the approach to data analysis for the study. The next chapter is concerned with presenting the results from sustainability disclosure analysis and providing results for the first objective of this study, to determine the level and type of voluntary sustainability reporting in company annual reports.

# CHAPTER 6
# SUSTAINABILITY DISCLOSURE ANALYSIS

## Introduction

This chapter presents sustainability disclosure analysis from the study employed to test the hypotheses formulated in chapter four using the methodology outlined in chapter five. The descriptive statistical results in this chapter measure the level and type of sustainability reporting using the Global Reporting Initiative (GRI) Index. All tests for descriptive statistics were run using the Statistical Program for Social Science (SPSS).

## Level of Sustainability Reporting

The results from this study confirm findings from earlier work by Frost et al. (2005a), that the number of Australian companies reporting sustainability information is low. For this study, the sample of annual reports viewed was 450. Out of the sample, 100 companies reported on sustainability information within their annual reports. It was noted that some company's annual reports were only presenting positive and very general information. Few companies annual reports consisted of a number of pages dedicated to sustainability reporting. Companies in the sample reported on a number of common GRI indicators, and a single company in the sample did not report some indicators. The number of GRI disclosures and percentage of companies disclosing are presented in Table 6.1.

As it can be seen in Table 6.1, the GRI indicators reported on included EN2, EN6, EN8, EN9, EN11, EN14, EN15, EN16, LA1, LA2, LA5, LA6, LA7, LA8, LA9, LA10, HR2, HR4, SO1, SO2, PR1 and PR2. The GRI indicators not reported on include EN1, EN3, EN4, EN5, EN7, EN10, EN12, EN13, LA3, LA4, HR1, HR3, HR5, HR6, HR7, SO3, and PR3. The most reported GRI indicators are LA7, followed by SO1 and EN16. The top nine GRI indicators reported can be seen on Table 6.2 and consist of a large number of core social indicators and small number of core environmental indicators.

**Table 6.1**
***Disclosure of GRI Indicators***

| GRI indicator* | Number of disclosures | % of disclosures |
|---|---|---|
| EN1 | 0 | 0 |
| EN2 | 3 | .7 |
| EN3 | 0 | 0 |
| EN4 | 0 | 0 |
| EN5 | 0 | 0 |
| EN6 | 1 | .2 |
| EN7 | 0 | 0 |
| EN8 | 1 | .2 |
| EN9 | 2 | .4 |
| EN10 | 0 | 0 |
| EN11 | 1 | .2 |
| EN12 | 0 | 0 |
| EN13 | 0 | 0 |
| EN14 | 4 | .88 |
| EN15 | 4 | .9 |
| EN16 | 28 | 6.22 |
| LA1 | 13 | 2.9 |
| LA2 | 7 | 1.6 |
| LA3 | 0 | 0 |
| LA4 | 0 | 0 |
| LA5 | 2 | .4 |
| LA6 | 18 | 4.0 |
| LA7 | 33 | 7.33 |
| LA8 | 2 | .4 |
| LA9 | 4 | .9 |
| LA10 | 2 | .4 |
| LA11** | n/a | n/a |
| HR1 | 0 | 0 |
| HR2 | 3 | .7 |
| HR3 | 0 | 0 |
| HR4 | 1 | .22 |

**Table 6.1 (Continued)**
***Disclosure of GRI Indicators***

| GRI indicator* | Number of disclosures | % of disclosures |
|---|---|---|
| HR5 | 0 | 0 |
| HR6 | 0 | 0 |
| HR7 | 0 | 0 |
| SO1 | 28 | 6.22 |
| SO2 | 1 | .2 |
| SO3 | 0 | 0 |
| PR1 | 1 | .2 |
| PR2 | 1 | .2 |
| PR3 | 0 | 0 |
| TOTAL | 160 | 35.55 |

*Note.* * For full description of these indicators refer to Table 2.1 on pages 8-10.
** This item (LA11) was excluded from the index, as this is not a voluntary disclosure item; it is required to be provided to the Australian Stock Exchange under Listing Rules 4.10.3 and 12.7

**Most Common Indicators**

There are common indicators reported among companies that voluntarily disclosed sustainability information. The nine most common indicators are provided on Table 6.2. As it can be seen on Table 6.2 the number one indicator reported is LA7 followed by SO1 and EN16 at number two; LA6 at number three; LA1 at number four; LA2 at number five; EN15, EN14 and LA9 at number six; EN2 and HR2 at number seven; EN9, LA5, LA8 and LA10 at number eight and EN6, EN8, EN11, HR4, SO2, PR1 and PR2 at number nine.

The most common indicator is LA7, which is a social health and safety indicator requiring companies to disclose on standard injury, lost day, absentee rates and number of fatalities (Global Reporting Initiative, 1999). This item was disclosed by thirty-three companies in the sample, indicating its importance amongst other GRI indicators.

Second most common indicators to be reported on are SO1 and EN16, a core social and core environmental indicator. SO1 indicator refers to society policies/ procedures and management systems are requires companies to disclose the impact of their operation has on the community (Global Reporting Initiative, 1999). The number of companies disclosing this item is twenty-eight. It is important to note that for this item, companies in the sample provided mostly positive impact that their operation has on the community. EN16 indicator is on compliance and twenty-eight companies disclosed this item. For this item, companies are required to disclose incidents and fines for non-compliance (Global Reporting Initiative, 1999). Whist some companies provide information on incidents and fines for non-compliance a number of companies stated that there were no incidents or fines for non-compliance.

Third most commonly reported GRI indicator is LA6, again a social indicator relating to labour health and safety. This item requires companies to provide description of formal joint health and safety committees (Global Reporting Initiative, 1999). The number of companies disclosing this item in the annual reports for the sampled companies was eighteen.

Fourth most common indicator is LA1, again a social indicator relating to labour employment. This item requires companies to disclose on the breakdown of the workforce (Global Reporting Initiative, 1999). The number of companies disclosing this item in their annual reports is thirteen.

Fifth most common indicator is LA2, again a social indicator referring to labour employment. For this item, companies are required to disclose the net employment creation and average turnover segmented by country (Global Reporting Initiative, 1999). The number of companies disclosing this item in their annual reports is seven.

Sixth most common indicators are EN15, which is, core environmental indicator, EN14 another core environmental indicator and LA9, which is a core social indicator. For EN15 companies are required to disclose on products and services more specifically the

percent of the weight of products sold that are reclaimable and the actual reclaim (Global Reporting Initiative, 1999). For LA9 companies are required to disclose on labour training and education, more specifically on the number of hours of training per employee per year, by category of employee (Global Reporting Initiative, 1999). For EN14 companies are required to disclose on significant environmental impacts of principal products. For all three items, the number of companies disclosing in annual reports is four.

Seventh most common indicators are EN2, a core environmental indicator and HR2 a core social factor. For EN2 companies are required to disclose on percentage of waste materials used from external sources (recycling). For the core social factor HR2, companies are required to disclose on human rights strategy and management, more specifically provide evidence of consideration of human rights impacts. For both of these items the number of companies disclosing in annual reports is three.

Eight most common indicators are core environmental factor EN9 and core social factors LA5, LA8 and LA10. For EN9, companies are required to disclose on emissions of ozone deleting substance, whilst for LA5, LA8 and LA10 companies are required to disclose on labour health and safety and labour diversity and opportunity. For all four items the number of companies disclosing in annual reports is two.

Ninth most common indicators are core environmental EN6, EN8, EN11 and core social are SO2, PR1 and PR2 and HR4. For EN6, EN8 and EN11 companies are required to disclose on biodiversity and emissions effluents and wastes. For SO2, PR1 and PR2, companies are required to disclose on bribery and corruption, consumer health and safety, product information and labelling and description of policies. For all seven items, the number of companies reporting in annual reports is one. The GRI indicators not reported on in sampled companies include core environmental factors EN1, EN3, EN4, EN5, EN7, EN10, EN12, EN13 and core social factors LA3, LA4, HR1, HR3, HR5, HR6, HR7, SO3, and PR3. Refer to chapter two Table 2.1 for the description of each of these individual indicators.

**Table 6.2**
***Top Nine GRI Indicators Reported***

| No | GRI indicator | Number of disclosures | % of companies disclosing |
|---|---|---|---|
| 1 | LA7 (Social) | 33 | 7.33 |
| 2 | SO1 (Social) | 28 | 6.22 |
| 2 | EN16 (Environmental) | 28 | 6.22 |
| 3 | LA6 (Social) | 18 | 4.0 |
| 4 | LA1 (Social) | 13 | 2.1 |
| 5 | LA2 (Social) | 7 | 1.6 |
| 6 | EN15 (Environmental) | 4 | 0.9 |
| 6 | LA9 (Social) | 4 | 0.9 |
| 6 | EN14 (Environmental) | 4 | 0.9 |
| 7 | EN2 (Environmental) | 3 | 0.7 |
| 7 | HR2 (Social) | 3 | 0.7 |
| 8 | EN9 (Environmental) | 2 | 0.4 |
| 8 | LA5 (Social) | 2 | 0.4 |
| 8 | LA8 (Social) | 2 | 0.4 |
| 8 | LA10 (Social) | 2 | 0.4 |
| 9 | EN6 (Environmental) | 1 | .22 |
| 9 | EN8 (Environmental) | 1 | .22 |
| 9 | EN11 (Environmental) | 1 | .22 |
| 9 | SO2 (Social) | 1 | .22 |
| 9 | PR1 (Social) | 1 | .22 |
| 9 | PR2 (Social) | 1 | .22 |

**Total Sustainability Reporting by Industry**

The results from this study indicate that the level of voluntary sustainability reporting across different industries differs. Based on the results presented in Table 6.3, consumer staples industry has the highest percentage of companies disclosing (55.55%), followed

by energy (41.38%), industrials (30.77%), materials (30.64%), utilities (25%), telecommunication services (22.22%), health care (15.19%) and consumer discretionary (12.24%) industries. The lowest percentage of companies disclosing was by information technology (2.32%) and health care industries (11.63%). The results in Table 6.3 also indicate that the number of disclosures per company disclosing differs across industries. When companies choose to disclose voluntary sustainability information, utilities industry disclosed the most by providing an average of six disclosure items. This is followed by materials (1.92), consumer staples (1.7), financials and telecommunication services (1.5), health care (1.2) and energy (1.16). Industries disclosing the least include consumer discretionary (1) and information technology (1).

**Table 6.3**
***Total Disclosures by Industry***

| Industry | Total disclosures | No. of companies disclosing | No. of companies in the sample | % of companies disclosing | Average disclosure per company disclosing |
|---|---|---|---|---|---|
| Consumer Staples | 17 | 10 | 18 | 55.55 | 1.7 |
| Consumer Discretionary | 6 | 6 | 49 | 12.24 | 1 |
| Energy | 14 | 12 | 29 | 41.38 | 1.166 |
| Financials | 12 | 8 | 79 | 15.19 | 1.5 |
| Health Care | 6 | 5 | 43 | 11.63 | 1.2 |
| Industrials | 21 | 16 | 52 | 30.77 | 1.31 |
| Information Technology | 1 | 1 | 43 | 2.32 | 1 |
| Materials | 74 | 39 | 124 | 30.64 | 1.92 |
| Telecommunication Services | 3 | 2 | 9 | 22.22 | 1.5 |
| Utilities | 6 | 1 | 4 | 25 | 6 |
| Total | 160 | 100 | 450 | 22.22 | 1.60 |

*Note.* N = 450

**Reporting of Core Environmental and Social Factors**

The Global Reporting Initiative (GRI) Index consists of core environmental and core social indicators. It was of interest to examine differences between companies in terms of which industries disclose on core environmental factors, and which industries disclose on core social factors. The industries reporting on core environmental and core social factors are presented in Table 6.4. As can be seen in Table 6.4 the number of companies disclosing on core social indicators is 116, this is significantly higher then the 44 companies disclosing on core environmental indicators.

Apart from information technology, all industries disclose on core social indicators whilst consumer staples sector does not disclose on core environmental indicators. Apart from telecommunication services and information technology sectors all other industries appear to be disclosing more information on their core social rather then core environmental indicators. Materials, consumer staples and industrials sectors appear to have the highest difference between their level of reporting on core social and core environmental factors. For materials, forty-nine companies disclosed on core social factors, whilst twenty-five disclosed on core environmental factors. For consumer staples seventeen companies disclosed on core social factors as opposed to zero disclosures being made for core environmental factors. For industrials sixteen companies disclosed on core social factors whilst only five disclosures were made in relation to environment.

Furthermore, materials sector disclosed the most information for both core environmental and core social factors, however this could be due to this sector dominating the sample. The second highest sector disclosing the most information on environment is industrials followed by energy. The second highest sector disclosing the most information on social factors is consumer staples followed by industrials. Sectors providing the least amount of disclosures relating to environment are consumer staples, consumer discretionary, health care and information technology. Sectors providing the least amount of social disclosures are information technology and telecommunication services. All data for reporting on core environmental and core social factors is presented in Table 6.4.

**Table 6.4**
***Number of Companies Disclosing Core Indicators by Industry***

| Industry | Core environmental | Core social |
|---|---|---|
| Consumer Staples | 0 | 17 |
| Consumer Discretionary | 1 | 5 |
| Energy | 4 | 10 |
| Financials | 3 | 9 |
| Health Care | 1 | 5 |
| Industrials | 5 | 16 |
| Information Technology | 1 | 0 |
| Materials | 25 | 49 |
| Telecommunication Services | 2 | 1 |
| Utilities | 2 | 4 |
| Total | 44 | 116 |

*Note*. N = 450

Table 6.5 presents the individual GRI indicators against industry sectors. By looking at this table the energy sector has four companies disclosing on EN16 and LA1, three disclosures on LA6, two on LA7 and one on SO1. Industrial sector has one disclosure on EN2, EN15, LA1, LA9, HR2; three disclosures on EN16, LA2, LA7, SO1; and four disclosures on LA6. Telecommunication services sectors had one disclosure on each of EN16, EN14 and SO1. Utilities sector had one disclosure made on each of the following; EN8, EN14, LA7, LA9, HR4 and SO1. From consumer staples six companies disclosed on LA7; three on SO1 and LA6; and one on HR2, LA9, LA5, LA1 and LA2. From materials nineteen companies disclosed on LA7; sixteen on EN16; fifteen on SO1; five on LA1; four on LA6; three on EN15; two on EN9, EN14, LA8, LA10; and one on EN2, EN11, LA5 and LA9. From consumer discretionary two company disclosed on SO1 and LA6; and one for each of EN16 and LA1. One disclosure was made from information technology and this was for EN16. Companies from health care sector made two disclosures on each of LA6 and SO1 and one disclosure on each of EN2 and LA2. Finally companies from financial sector made two disclosures for each of EN16 and SO1; and one disclosure for; EN6, LA1, LA2, LA6, HR2, SO2, PR1 and PR2.

**Table 6.5**
***Individual GRI Indicators by Industry***

| GRI Indicator | Energy | Industrials | Telecommunication Services | Utilities | Consumer Staples |
|---|---|---|---|---|---|
| EN1 | 0 | 0 | 0 | 0 | 0 |
| EN2 | 0 | 1 | 0 | 0 | 0 |
| EN3 | 0 | 0 | 0 | 0 | 0 |
| EN4 | 0 | 0 | 0 | 0 | 0 |
| EN5 | 0 | 0 | 0 | 0 | 0 |
| EN6 | 0 | 0 | 0 | 0 | 0 |
| EN7 | 0 | 0 | 0 | 0 | 0 |
| EN8 | 0 | 0 | 0 | 1 | 0 |
| EN9 | 0 | 0 | 0 | 0 | 0 |
| EN10 | 0 | 0 | 0 | 0 | 0 |
| EN11 | 0 | 0 | 0 | 0 | 0 |
| EN12 | 0 | 0 | 0 | 0 | 0 |
| EN13 | 0 | 0 | 0 | 0 | 0 |
| EN14 | 0 | 0 | 1 | 1 | 0 |
| EN15 | 0 | 1 | 0 | 0 | 0 |
| EN16 | 4 | 3 | 1 | 0 | 0 |
| *Total environmental* | *4* | *5* | *2* | *2* | *0* |
| LA1 | 4 | 1 | 0 | 0 | 1 |
| LA2 | 0 | 3 | 0 | 0 | 1 |
| LA3 | 0 | 0 | 0 | 0 | 0 |
| LA4 | 0 | 0 | 0 | 0 | 0 |
| LA5 | 0 | 0 | 0 | 0 | 1 |
| LA6 | 3 | 4 | 0 | 0 | 3 |
| LA7 | 2 | 3 | 0 | 1 | 6 |
| LA8 | 0 | 0 | 0 | 0 | 0 |
| LA9 | 0 | 1 | 0 | 1 | 1 |
| LA10 | 0 | 0 | 0 | 0 | 0 |
| LA11 | - | - | - | - | - |
| HR1 | 0 | 0 | 0 | 0 | 0 |
| HR2 | 0 | 1 | 0 | 0 | 1 |
| HR3 | 0 | 0 | 0 | 0 | 0 |
| HR4 | 0 | 0 | 0 | 1 | 0 |

**Table 6.5 (Continued)**
***Individual GRI Indicators by Industry***

| GRI Indicator | Energy | Industrials | Telecommunication Services | Utilities | Consumer Staples |
|---|---|---|---|---|---|
| HR5 | 0 | 0 | 0 | 0 | 0 |
| HR6 | 0 | 0 | 0 | 0 | 0 |
| HR7 | 0 | 0 | 0 | 0 | 0 |
| SO1 | 1 | 3 | 1 | 1 | 3 |
| SO2 | 0 | 0 | 0 | 0 | 0 |
| SO3 | 0 | 0 | 0 | 0 | 0 |
| PR1 | 0 | 0 | 0 | 0 | 0 |
| PR2 | 0 | 0 | 0 | 0 | 0 |
| PR3 | 0 | 0 | 0 | 0 | 0 |
| *Total social* | *10* | *16* | *1* | *4* | *17* |
| **Total GRI** | **14** | **21** | **3** | **6** | **17** |

**Table 6.5 (Continued)**
***Individual GRI Indicators by Industry***

| GRI Indicator | Financials | Information Technology | Health Care | Consumer Discretionary | Materials |
|---|---|---|---|---|---|
| EN1 | 0 | 0 | 0 | 0 | 0 |
| EN2 | 0 | 0 | 1 | 0 | 1 |
| EN3 | 0 | 0 | 0 | 0 | 0 |
| EN4 | 0 | 0 | 0 | 0 | 0 |
| EN5 | 0 | 0 | 0 | 0 | 0 |
| EN6 | 1 | 0 | 0 | 0 | 0 |
| EN7 | 0 | 0 | 0 | 0 | 0 |
| EN8 | 0 | 0 | 0 | 0 | 0 |
| EN9 | 0 | 0 | 0 | 0 | 2 |
| EN10 | 0 | 0 | 0 | 0 | 0 |
| EN11 | 0 | 0 | 0 | 0 | 1 |
| EN12 | 0 | 0 | 0 | 0 | 0 |
| EN13 | 0 | 0 | 0 | 0 | 0 |
| EN14 | 0 | 0 | 0 | 0 | 2 |
| EN15 | 0 | 0 | 0 | 0 | 3 |
| EN16 | 2 | 1 | 0 | 1 | 16 |
| *Total environmental* | *3* | *1* | *1* | *1* | *25* |
| LA1 | 1 | 0 | 1 | 0 | 5 |
| LA2 | 1 | 0 | 1 | 1 | 0 |
| LA3 | 0 | 0 | 0 | 0 | 0 |
| LA4 | 0 | 0 | 0 | 0 | 0 |
| LA5 | 0 | 0 | 0 | 0 | 1 |
| LA6 | 1 | 0 | 1 | 2 | 4 |
| LA7 | 0 | 0 | 2 | 0 | 19 |
| LA8 | 0 | 0 | 0 | 0 | 2 |
| LA9 | 0 | 0 | 0 | 0 | 1 |
| LA10 | 0 | 0 | 0 | 0 | 2 |
| LA11 | - | - | - | - | - |
| HR1 | 0 | 0 | 0 | 0 | 0 |
| HR2 | 1 | 0 | 0 | 0 | 0 |
| HR3 | 0 | 0 | 0 | 0 | 0 |
| HR4 | 0 | 0 | 0 | 0 | 0 |

**Table 6.5 (Continued)**
***Individual GRI Indicators by Industry***

| GRI Indicator | Financials | Information Technology | Health Care | Consumer Discretionary | Materials |
|---|---|---|---|---|---|
| HR5 | 0 | 0 | 0 | 0 | 0 |
| HR6 | 0 | 0 | 0 | 0 | 0 |
| HR7 | 0 | 0 | 0 | 0 | 0 |
| SO1 | 2 | 0 | 0 | 2 | 15 |
| SO2 | 1 | 0 | 0 | 0 | 0 |
| SO3 | 0 | 0 | 0 | 0 | 0 |
| PR1 | 1 | 0 | 0 | 0 | 0 |
| PR2 | 1 | 0 | 0 | 0 | 0 |
| PR3 | 0 | 0 | 0 | 0 | 0 |
| *Total social* | *9* | *0* | *5* | *5* | *49* |
| **Total GRI** | **12** | **1** | **6** | **6** | **74** |

**Sustainability Reporting by Audit Firm**

The results from this study indicate that the level of voluntary sustainability reporting differs between companies audited by a big four audit firm and non big four audit firm. Based on the results presented in Table 6.6, audited by a big four audit firm companies have a higher percentage of disclosure (28.57%) then firms not audited by a big four audit firm (14.14%). Furthermore, differences are evident between the big four audit firms. Companies audited by KPMG have the highest percentage (32.35%) of disclosure among the big four audit firms, followed by Ernst & Young (30.86%), PricewaterhouseCoopers (26.47%) and Deloitte (19.4%).

The results in Table 6.6 also indicate that the number of disclosures per company disclosing differs between companies audited by a big four audit firm and those not audited by a big four audit firm. When companies choose to disclose voluntary sustainability information, those audited by a big four audit firm provide an average of

1.68 disclosures, whilst those not audited by a big four audit firm tend to provide an average of 1.39 disclosures. Differences also exist between the big four audit firms. When companies are audited by Deloitte they provide an average of 2.28 disclosure items, 1.86 by KPMG, 1.55 by PricewaterhouseCoopers and 1.45 by Ernst and Young.

**Table 6.6**
***Disclosure of Sustainability Information by Audit Firm***

| Audit firm | Total disclosures | No. of companies disclosing | No. of companies in the sample | % of companies disclosing | Average disclosures per company disclosing |
|---|---|---|---|---|---|
| Big Four Audit | 121 | 72 | 252 | 28.57 | 1.68 |
| Ernst and Young | 36 | 25 | 81 | 30.86 | 1.44 |
| PWC | 28 | 18 | 67 | 26.47 | 1.55 |
| KPMG | 41 | 22 | 68 | 32.35 | 1.86 |
| Deloitte | 16 | 7 | 36 | 19.4 | 2.28 |
| Non - Big Four | 39 | 28 | 198 | 14.14 | 1.39 |

*Note*. N = 450

**Summary of Sustainability Reporting**

The level of sustainability reporting in annual reports is low, out of 450 annual reports viewed 100 companies reported on sustainability information. It was identified that companies tend to disclose on common GRI indicators. The most commonly disclosed indicator was social and referred to health and safety. It was noted that the level of disclosures for social indicators was higher then for environmental indicators. The top nine commonly reported indicators consisted of 14 social factors and 8 environmental factors. The number of companies disclosing and the level of disclosure differed between industries and companies audited by a big four audit firm.

Consumer staples industry had the highest percentage of companies disclosing followed by energy, industrials, materials, utilities, telecommunication services, health care and consumer discretionary. The lowest percentage of companies disclosing was by information technology and health care industries. Utilities had the highest level of disclosure per company followed by materials, consumer staples, financials and telecommunication services, health care and energy. Industries disclosing the least per company included consumer discretionary and information technology.

Companies audited by a big four audit firm companies have a higher percentage of disclosure then firms not audited by a big four audit firm. Furthermore, differences are evident between the big four audit firms. Those audited by KPMG have the highest percentage, of disclosure among the big four audit firms. Audited by a big four companies have higher level of disclosure per company then other companies. Those audited by KPMG are tend to provide a higher average per company then other big four audit firms.

**Summary**

This chapter has presented and discussed the results from sustainability disclosure analysis. The next chapter will present and discuss the results from univariate analysis used and multiple regression analysis including relevant and associated tests.

# CHAPTER 7
# REGRESSION RESULTS ANALYSIS

## Introduction

This chapter presents and discusses regression results analysis from the study employed to test the hypotheses formulated in chapter four using the methodology outlined in chapter five. The multiple regression statistical results in this chapter are aimed at explaining key characteristics differentiating organisations and the extent to which they choose to voluntarily disclose sustainability information within their annual reports. All tests were run using the Statistical Program for Social Science (SPSS).

## Descriptive Statistics

To begin with, descriptive statistics were employed to examine and describe the central tendency and the distribution of the variables. From descriptive statistics the mean, standard deviation, kurtosis and skewness were collected to explain the nature of the individual variables. The median of the variables was obtained from performing the frequency function in SPSS. Descriptive statistics of raw data are presented in Table 7.1.

According to Barrow (1996, p.4) the main objective of descriptive statistics is to provide information in concise, clear and accurate way. Descriptive statistics are not able to provide more then to simply describe the observed data and for further analysis of the data, other methods such as multivariate analysis must be employed. However, before such method can be undertaken it is valuable to look at the descriptive statistics to ensure that the assumptions underlying the multivariate analysis are observed. This is where descriptive statistics add value. There are five assumptions underlying the multivariate analysis including normality, non-colinearity, linearity, independence of error and constant variance of error terms (Tabachnick and Fidell, 2001).

**Test of Normality**

By looking at the raw results in Table 7.1, it is apparent that the variables depart from the normal distribution and that outliers are present. Normality is present where skewness for variables falls between -1 and +1 and kurtosis falls between -2 and +2 (Field, 2005). As presented in Table 7.1 variables VSDI, OWN, LEV and SIZE are positively skewed and variable PROF is negatively skewed. The kurtosis for the variables also indicates that certain variables depart from normality. All variables have a high peak in their distribution.

**Table 7.1**
***Descriptive Statistics - Raw Data***

| Variable | Mean | Median | SD | Kurtosis | Skewness |
|---|---|---|---|---|---|
| VDSI (d)* | .3600 | .0000 | .8350 | 13.0530 | 3.2530 |
| OWN (%) | 36.0000 | 34.9000 | 21.6000 | 2.3740 | .6020 |
| LEV $ (m)** | 1.5855 | .0994 | 23.8779 | 445.2710 | 21.0530 |
| SIZE1 $ (m) | 49.8445 | 22.5650 | 2737.5322 | 162.2200 | 11.9850 |
| SIZE2 $ (m) | 29.6510 | .0088 | 195.2010 | 146.4880 | 11.3630 |
| PROF $ (m) | -3.0679 | .0044 | 471.0445 | 99.7310 | -2.9100 |

*Note.* N = 450
* Proportion of disclosures (d) per company
** Proportion per million

**Test of Multi-collinearity**

Collinearity statistics were performed on raw data to determine if any variables were affected by multi-collinearity. High level of collinearity is indicated when the T value is zero or close to zero (Tabachnick and Fidell, 2001). According to Menhard (1995) where the T value is close to .2, this should be of concern. In addition where the voluntary inflation factor (VIF) values are close to 10 this may also indicate the presence of multicollinarity (Bowerman and O'Connell, 1990). Where T values are not close to zero and the VIF values are close to 1 this indicates low level of multicollinearity (Berry,

1993; Pallant, 2001). The results of this test indicated that two variables might have been affected by multicollinearity; this was the case for SIZE1 and SIZE2. The variable SIZE1 had T value of .100 and VIF value of 10.016 and variable SIZE2 had a T value of .100 and VIF 10.018, these values were of concern. Due to these results, it was decided that one variable had to be removed from the model, variable SIZE2 was selected to be removed on this instance because variable SIZE1, as measured by market capitalisation is more widely used. Furthermore, variable SIZE2 was selected for removal because the other variable appeared in the descriptive statistics to be more normally distributed. After the removal of this variable collinearity statistics were preformed once again, this time no variables appeared to be materially affected by multicollinearity.

**Outliers**

Data is some cases can be affected by few very large or few very small values, these are referred to as outliers (Field, 2005). The presence of outliers can be detected in a number of ways including through the use of normal probability plot, scatter plot and the use of Mahalanobis distances produced by multiple regression program. Initially normal probability plot and scatter plot were viewed to determine if any outliers were present. From looking at these plots the presence of outliners was determined. To further investigate the outliers Mahalanobis and Cooks distance were performed, these results indicated a number of outliers. As suggested by Field (2005) and Stevens (1992) data was checked to determine the presence of coding errors, no such errors were detected in the observed data. Data transformation was also performed on variables to determine if variables would be improved. Due to significant differences between the outliers and the rest of the data, transformation was not successful on this instance. For this reason it was decided that influential outliers had to be removed from rest of the data. Presence of influential cases can be determined where the Cooks distance is larger the 1 (Stevens, 1992). The removal of five outliers significantly improved the data, however some variables still departed from normality and needed transformation.

**Data Transformation**

Based on the results from the descriptive statistics it is clear that certain variables depart from normality. Data transformation can be used to overcome this problem (Tabachnick and Fidell, 1996). All variables which depart from normality were transformed. According to Tabachnick and Fidell (1996) square root transformation should be used where the distribution differs moderately from normality, log transformation should be used where the distribution differs substantially and inverse transformation should be used where the distribution differs severely. Table 7.2 describes the transformations undertaken in this study. The distribution for independent variables SIZE 1, LEV and dependent variable VDSI differ substantially and as such log transformation was appropriate. Variables VDSI, LEV and SIZE 1 all had lowest value of zero and one was added to each value as log transformation cannot be undertaken on zero or negative values (Field, 2005). The distribution for dependent variable PROF differ moderately from normality and square root transformation was appropriate in this case.

**Table 7.2**
***Data Transformation***

| Variable | Transformation |
|---|---|
| VDSI | Log: LG10 (VSDI + 1) |
| SIZE1 | Log: LG10 (SIZE1 + 1) |
| PROF | Square Root: SQRT (PROF +1) |
| LEV | Log: LG10 {SIZE1 + (Biggest negative x 1) +1)} |

Table 7.3 presents the results after the removal of outliers, removal of variable SIZE2 and after the data transformation outlined above. As it can be seen in the new results both the kurtosis and skewness figures for the results are smaller and closer to normality. From the removal of outliers, the dependent variable VDSI and all independent variables were improved and brought closer to normality.

Based on the results of transformed data variable SIZE1 is now normally distributed as its kurtosis falls between -2 and +2 and skewness falls between -1 and +1. Variables VDSI, LEV and PROF still falls outside normality (skewness > 1 and kurtosis > 2). However, the mean and median are comparatively closer together. Variable OWN did not require transformation as this variable was normally distributed from the removal of significant outliers. Variables BFAF and INDT are categorical variables and therefore data transformation was not applicable for these variables.

**Table 7.3**
***Descriptive Statistics - Data Transformation***

| Variable | Mean | Median | SD | Kurtosis | Skewnes |
|---|---|---|---|---|---|
| LOG: VDSI (d)* | .0850 | .0000 | .1718 | 3.2840 | 1.9850 |
| OWN (%) | n/a | n/a | n/a | n/a | n/a |
| LOG: LEV $ (m)** | .1273 | .1158 | .1265 | 40.5770 | 4.4190 |
| BFAF | n/a | n/a | n/a | n/a | n/a |
| LOG: SIZE1 $ (m) | 1.6104 | 1.4109 | .8056 | .0790 | .8510 |
| SQRT: PROF $ (m) | 57.7432 | 57.8178 | 3.9903 | 124.9370 | 4.5990 |
| INDT | n/a | n/a | n/a | n/a | n/a |

*Note*. N = 450
n/a = no transformation was applicable
* Proportion of disclosures (d) per company
** Proportion per million

**Univariate Statistics**

Pearson's Correlation was employed to test the relationship between the dependent variable and each of the independent variables. The results from univariate analysis are able to provide us with information about the strength of the relationship between each of the independent variables and the dependent variable and also the significance of each of the variables (Cohen, 1988; Cohen, 1977; Stevens, 1992; Pallant, 2001).

Table 7.4 presents the results from Pearson's Correlation. The results indicate that independent variables BFAF, INDT and SIZE have a relationship with the independent variable VDSI and all are positively associated. According to Cohen (1977) when the r value is between .10 and .29 (either negative or positive) a small or weak relationship exists, when the r value is between .30 and .49 (either negative or positive) a medium relationship exists, when the r value is between .50 and 1 (either negative or positive) a large or strong relationship exists and where values fall outside of these amounts then no relationship exist.

Variables BFAF ($r = 0.182$) and INDT ($r = 0.210$) have a weak positive relationship with the dependent variable VDSI. Variables SIZE1 ($r = 0.330$) has a moderate positive relationship with the dependent variable VDSI. No individual relationship is evident between the independent variables OWN ($r = 0.067$), LEV ($r = .052$), and PROF ($r = 0.007$) with the dependent variable VDSI.

According to Cohen (1977) variables are statistically significant when their correlated significance falls between 0.001 and 0.05 for one tailed tests. The results from Pearson's Correlation indicate that independent variables BFAF ($p < 0.01$), INDT ($p < 0.01$) and SIZE1 ($p < 0.01$) are statistically significant. Variables PROF ($p > 0.05$), LEV ($p < 0.05$) and OWN ($p > 0.05$) are not statistically significant.

.

**Table 7.4**
***Results from Pearson Correlation***

| | LOG (VDSI) | OWN | LOG (LEV) | BFAF | INDT | SQRT (PROF) | LOG SIZE |
|---|---|---|---|---|---|---|---|
| LOG(VDSI) | | | | | | | |
| P. Correlation | 1 | | | | | | |
| Sig. (1-tailed) | - | | | | | | |
| OWN | | | | | | | |
| P. Correlation | .067 | 1 | | | | | |
| Sig. (1-tailed) | .071 | - | | | | | |
| LOG(LEV) | | | | | | | |
| P. Correlation | .052 | -.128** | 1 | | | | |
| Sig. (1-tailed) | .137 | .000 | - | | | | |
| BFAF | | | | | | | |
| P. Correlation | .182** | -.012 | -.014 | 1 | | | |
| Sig. (1-tailed | .000 | .404 | .381 | - | | | |
| INDT | | | | | | | |
| P. Correlation | .210** | .113** | -.154** | -.074 | 1 | | |
| Sig. (1-tailed) | .000 | .000 | .001 | .060 | - | | |
| SQRT(PROF) | | | | | | | |
| P. Correlation | .007 | -.023 | .010 | .014 | -.112** | 1 | |
| Sig. (1-tailed) | .445 | .315 | .413 | .381 | .009 | - | |
| LOG(SIZE) | | | | | | | |
| P. Correlation | .330** | -.066 | .055 | .416** | -.155** | .062 | 1 |
| Sig. (1-tailed) | .000 | .090 | .122 | .000 | .001 | .097 | - |

*Note.* ** Correlation is significant at the 0.01 level (1-tailed)

**Multivariate Statistics**

Table 7.5 presents the results from the ordinary least squares multiple regression analysis. As indicated, the regression results of sustainability disclosure indicate $R^2$ of 0.193 which was statistically significant (F = 17.435; p = 0.000). Two variable were found to be significant SIZE1 and INDT (p < 0.0005). All significant variables were significant in expected direction. The remaining four variables including OWN, LEV, BFAF and PROF were not found to be significant but were all in the expected direction. The results from multiple regression analysis are presented in Table 7.5.

**Table 7.5**
***Results from Multiple Regression***

| Variable | Beta | Tolerance | VIF | T | Sig. (1 - tailed) |
|---|---|---|---|---|---|
| OWN | .074 | .971 | 1.030 | 1.688 | .0920 |
| LEV | .085 | .962 | 1.040 | 1.943 | .0530 |
| BFAF | .060 | .825 | 1.212 | 1.260 | .2080 |
| SIZE1 | .347 | .806 | 1.240 | 7.263 | .0000** |
| PROF | .012 | .984 | 1.016 | 0.286 | .7750 |
| INDT | .274 | .936 | 1.068 | 6.184 | .0000** |

*Note*. N = 450
Adjusted $R^2$ = .193; F-ratio = 17.435 (p = .000)
** Correlation is significant at the 0.01 level (1-tailed)

**Discussion of Results**

The results from this study indicate that certain variables from positive accounting theory are able to significantly explain the level of voluntary sustainability disclosures in annual reports, whilst other variables are less able to. By looking at Table 7.5 it is evident that variables SIZE1 and INDT are highly significant and therefore able to explain the level of sustainability reporting. The four variable which are found to be

insignificant in this study include OWN, LEV, BFAF and PROF. Nevertheless, OWN and LEV are moderately significant and all variables are found to be in the expected direction. The results of this study indicated size and industry type can be used to explain the level of voluntary sustainability reporting by companies in annual reports. Thus hypotheses four and six are accepted. Ownership diffusion, leverage, big four audit firm and profitability cannot be used to explain the level of voluntary disclosure and consequently hypotheses one, two, three and five cannot be accepted as they are not found to be highly significant.

**Summary**

This chapter has presented and discussed the results of the tests developed to investigate the hypothesis formulated regarding the voluntary sustainability reporting based on the positive accounting framework. The results indicate that certain variables from the positive accounting framework can and cannot be used to explain the level of voluntary sustainability reporting in annual reports. The next chapter will focus on summarising the findings of the study as well as outlining the limitations, implications and suggestions for future research.

# CHAPTER 8
# CONCLUSION

Chapter two covered the sustainability indexes including explanation and current literature on the Global Reporting Initiative (GRI) Index and other sustainability indexes. The chapter also defended the use of the index for this study by providing current literature which states that it is the most commonly used comprehensive format.

Chapter three reviewed the literature by looking at the recent and relevant studies on the extent and type of sustainability reporting and the characteristics of companies reporting sustainability information and other research on sustainability. The review of literature was important in identifying the theoretical framework, developing explanatory variables and formulating hypotheses for the study.

Chapter four outlined the positive accounting theory and discussed its relevance in voluntary disclosure. Six explanatory variables were selected based on the two aspects of political and agency costs that are fundamental to positive accounting theory. The six explanatory variables included in this study were ownership diffusion, leverage, size, profitability, audit by big four-audit firm and industry type. Based on the positive accounting theory and review of literature six testable hypothesis were developed.

Chapter five explained the research methodology employed for this study. It included the research design, population, sample, data collection and recording method, definition of variables and data analysis used to collect the relevant information to test the hypothesis developed in chapter four and to answer the research problems detailed in chapter one.

Chapters six and seven presented the sustainability disclosure analysis, univariate and multiple regression analysis of the study from the tests undertaken that evaluate the association between the organisational characteristics and the level of voluntary sustainability disclosure within annual reports using the positive accounting framework.

**Findings of the Study**

The results from descriptive analysis indicate that the level of sustainability reporting in annual reports in low, out of 450 annual reports viewed 100 companies on sustainability information. It was identified that companies tend to disclose on common GRI indicators. The most commonly disclosed indicator was social and referred to health and safety. It was noted that the level of disclosures for social indicators was higher then for environmental indicators. The top nine commonly reported indicators consisted of 14 social factors and 8 environmental factors. The number of companies disclosing and the level of disclosure differed between industries.

The results of univariate analysis indicate that independent variables big four audit firm, industry and size have a individual relationship with the independent variable voluntary disclosure of sustainability information and all are positively associated. With size as an exception all variables are found to have a weak positive relationship with the dependent variable. Variable size has a moderate positive relationship and the strongest relationship with the independent variable voluntary disclosure of sustainability information.

The results from ordinary least square regression indicate that some variables from positive accounting theory are able to explain the level of voluntary sustainability disclosures in annual reports, whist other variables are not able. Variables size and industry are significant and therefore able to explain the level of voluntary sustainability reporting. These results indicate that larger sized companies and those from identifiable industry are positively associated with sustainability information. Four variable are found to be insignificant including ownership diffusion, leverage, big four audit firm and profitability. Nevertheless, ownership diffusion and leverage are moderately significant and all variables are found to be in the expected direction.

**Implications of the Findings**

The findings of this study have implications for the users of annual reports, the regulators of financial information in Australia, preparers of annual reports and policy and decision makers. The information is useful for users of annual reports as they now have an insight into sustainability reporting. Users now know that a small number of companies disclose sustainability information and those that do disclose provide very little information. Should users need this type of information it may be problematic to extract from annual reports. Users will now be able to associate company characteristics with the extent of voluntary sustainability disclosure. For the regulators of financial information the findings of this study indicate that the preparers of annual reports do not appear to care much about voluntarily disclosing sustainability information. These results indicate that should regulators proceed with the introduction of a sustainability standard they may encounter opposition of preparers of annual reports, thus a lengthy transition period may be required prior to the introduction of a standard on sustainability. Especially if this is based on the GRI index. Furthermore, the implication for preparers would include more training and time, hence cost in collecting and reporting this type of information. For policy and decision makers this may mean creating more policies and guidelines to address all aspects of sustainability and changes to the existing processes and operations to reflect the approach in reporting.

**Limitations**

Due to time constraints, the sample for this study was limited to 450 companies' annual reports on Fin Analysis database. This limitation was managed by ensuring that a stratified sample of companies was selected and that all industries were included. Due to time constraints and availability of data, the study was also limited to one year 2004 and to the companies listed on the Fin Analysis database. However, it was a recent year available and therefore indicative of recent sustainability reporting by listed companies in Australia. The study is also limited to annual reports and other sources such as standalone reports, press reports and websites could have been used. However, annual reports are the most important document prepared by the company and are widely used

as source of information for the company. The study is also limited to the use of the dichotomous index which does not rank the importance of disclosed items, however this may also be an advantage because it prevents mistakes in ranking of disclosure items (Marston and Shrives, 1991). Another limitation to this study is the materiality standard which may effect company disclosure. If the disclosing item is perceived to be immaterial or if the amount is immaterial to the company, they may elect not to disclose. However, since sustainability reporting is voluntary, companies are not obliged to follow the standard and may still elect to disclose immaterial items or immaterial amounts.

**Suggestions for Future Research**

The limitations of this study indicate direction for future research. Firstly, the sample size could be increased and not restricted to companies on Fin Analysis database. Perhaps future researchers in this area could also consider a longitudinal study to provide information on sustainability reporting over time. This study did not consider the actual performance but rather the disclosure within annual reports and therefore future studies could incorporate both areas. Further disclosure of sustainability in other sources including annual reports could be investigated. Future researchers may also consider use of a weighted or word index instead of an unweighted dichotomous index. Other data collection methods may also be undertaken in future studies such as interviews/surveys or questionnaires.

**References**


Adams, C.A. (2004). The ethical, social and environmental reporting-performance portrayal gap. *Accounting, Auditing & Accountability Journal, 15*(5), 731-757.

American Psychological Association. (2001). *Publication manual of the American Psychological Association* (5th edition). Washington, DC: APA Books.

Australian Government Department of the Environment and Heritage. (2005). *The state of sustainability reporting in Australia 2005*. Canberra: CAER, KPMG and Deni Greene Consulting Services.

Australian Government Department of the Environment and Heritage. (2004). *The state of sustainability reporting in Australia 2004*. Canberra: CAER, KPMG and Deni Greene Consulting Services.

Australian Stock Exchange. (2006). *ASX listing rules chapters*. Retrieved January, 20, 2006, from http://www.asx.com.au/supervision/rules/listing/chapters.htm

Ball, R., Kothari, S., & Robin, A. (2000). The effect of international institutional factors on properties of accounting earning. *Journal of Accounting and Economics, 29*(1), 1-51.

Barrow, M. (1996). *Statistics for economics, accounting and business studies* (2nd edition). New York: Longman.

Bazley, M., Brown, P., & Izan, H.Y. (1985). An analysis of lease disclosures by Australian companies. *Abacus, 21*(1), 44-62.

Berry, W.D. (1993). *Understanding regression assumptions*. Newbury Park, CA: Sage.

Bowerman, B.L., & O'Connell, R.T. (1990). *Linear statistical models: An applied approach* (2nd edition). Belmont, CA: Duxbury.

Bradbury, M.E. (1992). Voluntary disclosure of financial segment data: New Zealand evidence. *Accounting and Finance, 32*(1), 15-26.

Buffini, F. (2005). Leave responsibility to us, says business. *The Australian Financial Review*, p. 11.

Carlson, W.L., & Thorn, B. (1997). *Applied statistical methods for business, economics and the social sciences*. New Jersey: Prentice Hall, Upper Saddle.

Carney, T.F. (1972). *Content analysis: A technique for systematic inference from communications*. London: B. T. Batsford Ltd.

Choi, J.H., & Wong, T.J. (2002). *Auditor choice and legal environment: An international investigation*. Paper presented at the Accounting association of Australia and New Zealand.

Chew Y. (1993). *Determinants of accounting policy for identifiable intangible assets.* Unpublished Honours Thesis, Edith Cowan University, Perth, Western Australia.

Cohen, J.W. (1988). *Statistical power analysis of the behavioural sciences (2nd edition).* Hillsdale, NJ: Lawrence Erlbaum Associate.

Cohen, J.W. (1977). *Statistical power analysis of the behavioural sciences*. New York: Academic Press.

Cooke, T.E. (1989). *An empirical study of financial disclosures by Swedish companies.* London: Garland Publishing, Inc.

Coy, D., Tower, G., & Dixon, K. (1991). Quantifying the quality of tertiary education annual reports. *Accounting and Finance, 33*(2), 121-129.

Craswell, A.T., & Taylor, S.L. (1992). Discretionary disclosure of reserves by oil and gas companies: An economic analysis. *Journal of Business, Finance and Accounting, 19*(2), 295-308.

Cullen, L. (2001). *Determinants of corporate governance disclosures by Australian listed companies subsequent to the introduction of ASX listing rule 4.10.3.* Unpublished Masters Thesis, Edith Cowan University, Perth, Western Australia.

Davis-Walling, P., & Batterman, S.A. (1997). Environmental reporting by the Fortune 50 firms. *Environmental Management, 21*(6), 865-875.

Deegan, C. (2003). *Australian financial accounting.* Sydney: McGraw-Hill Irwin.

Deegan, C. (2001). *Financial accounting theory.* Sydney: The McGraw-Hill Companies.

Deegan, C., & Carroll, G. (1993). An analysis of incentives for Australian firms to apply for Reporting Excellence Award. *Accounting and Business Research, 23*(91), 219-227.

Deegan, C.M., & Gordon, B. (1994). *An analysis of the incentives of Australian firms to provide environmental information within their annual accounts.* Paper presented at the Accounting Research Group Seminar Series, Edith Cowan University, Perth, Western Australia.

Deegan, C., & Hallam, A. (1991). The voluntary presentation of value added statements in Australia: A political cost perspective. *Accounting and Finance, 31*(1), 1-21.

De Vellis, R.F. (1991). *Scale development: Theory and application.* Newbury, California: Sage Publications.

Emmert, P., & Barker, L.L. (1989). *Measurement of communication behaviour*. New York: Longman.

Field, A. (2005). *Discovering statistics using SPSS* (2nd edition). London: SAGE Publications.

Field, A.P., & Hole, G.J. (2003). *How to design and report experiments*. London: SAGE Publications.

Freedman, M., & Wasley, C. (1990). The assumption between environmental performance and environmental disclosures in annual reports and 10K. *Advances in Public Interest Accounting, 3,* 183-193.

Frost, G., Jones, S., Loftus, J., & Laan, S.V.D. (2005a). *Sustainability reporting: Practices, performance and potential*. Melbourne: CPA Australia.

Frost, G., Jones, S., Loftus, J., & Laan, S.V.D. (2005b). A survey of sustainability reporting practices of Australian reporting entities. *Australian Accounting Review, 15*(1), 89.

Gee, C., & Slater, A. (2005). Developing the next generation GRI guidelines. *Corporate Responsibility Management, 1*(5), 30.

Gettler, L. (2006). Australian lifts game in sustainability report, but still trails the world. *The Age,* p. B2.

Gibson, K., & O'Donovan, G. (1994). *Green accounting in Australia: Myth or reality?* Paper presented at the AAANZ Annual Conference, Wollongong University, Wollongong. New South Wales, Australia.

Gibson, R., & Guthrie, J. (1995). Recent environmental disclosures in annual reports of Australian public and private sector organisations. *Accounting Forum, 19*(2/3), 111-127.

Global Reporting Initiative GRI. (2005). *Sustainability reporting guidelines. Retrieved December, 24, 2005, from http://*www.globalreporting.org.

Global Reporting Initiative GRI. (2000). *Sustainability reporting guidelines on economic, environmental, and social performance.* Boston: GRI.

Global Reporting Initiative. (1999). *Sustainability reporting guidelines: Exposure draft for public comment and testing.* London: GRI.

Godfrey, J.M., & Jones, K.I. (1999). Political cost influence on income smoothing via extraordinary item classification. *Accounting and Finance,* 255-274.

Gray, G., Farley, A., & Peirson, G. (1993). *The voluntary disclosure of a value added statement.* Paper presented at annual conference and meeting of the Accounting Association of Australia and New Zealand. Darwin, Australia.

Gray, R., Owen, D., & Maunders, K. (1988). Corporate social reporting: Emerging trends in accountability and the social contract. *Accounting Auditing and Accountability Journal, 1*(1) 6-20.

Guthrie, J., & Mathews, M.R. (1985). Corporate social accounting in Australia. *Research in Corporate Social Performance and Policy, 7,* 251-277.

Guthrie, J., & Parker, L.D. (1989). Corporate social reporting: A rebuttal of the legitimacy theory. *Accounting and Business Research, 19*(76) 343-352.

Hackston, D., & Milne, M.J. (1996). Some determinants of social and environmental disclosures in New Zealand companies. *Accounting, Auditing & Accountability Journal, 9*(1), 77-108.

Hair, J.F., Anderson, R.E., & Tatham, R.L. (1987). *Multivariate data analysis* (2nd edition with readings). London: Macmillan Publishing Company.

Hassan, S. (1995). *Determinants of the decision to capitalise financial leases by the lessee: Australian evidence.* Unpublished Master Thesis, Edith Cowan University, Perth, Western Australia.

Hassan, S. (1994). *Voluntary disclosure of cash flow information in Australia.* Unpublished Honours Thesis, Edith Cowan University, Perth, Western Australia.

Henderson, S., Peirson, G., & Harris, K. (2004). *Financial Accounting Theory*. NSW: Pearson Prentice Hall.

Hutomo, S. (1996). *Voluntary environmental disclosure by Australian listed mineral mining companies; An application of stakeholder theory*. Unpublished Master Thesis, Edith Cowan University, Perth, Western Australia.

Jensen, M.C., & Meckling, W.H. (1976). Theory of the firm: Managerial behaviour, agency costs, and ownership structure. *Journal of Finance and Economics, 3*(4) 305-360.

Kelly, G.J. (1981). Australian social responsibilities disclosures: Some insights into contemporary measurement. *Accounting and Finance, 21*(2), 97-101.

Kelly, G.J. (1981). Australian social responsibilities disclosures: Some insights into contemporary measurement. *Accounting and Business, 21*(2), 97-107.

Kirkham, P., & Hope, C. (1992). *Environmental disclosures in annual reports.* University of Cambridge Management Studies Research Paper, 1692.

Kolk, A. (2003). Trends in sustainability reporting by the Fortune Global 250. *Business Strategy and the Environment, 12*, 279-291.

Kolk, A. (2004). More than words? An analysis of sustainability reports. *New Academy Review, 3*(3), 59-75.

Kolk, A. (2005). Environmental reporting by multinationals from the Triad: Convergence or divergence? *Management International Review, 45*(Special Issue), 145-166.

Kong, G.S. (1996). *Social disclosure by Australian listed mineral mining companies: A stakeholder approach.* Unpublished Master Thesis, Edith Cowan University, Perth, Western Australia.

KPMG. (2005). *KPMG international survey of corporate responsibility reporting 2005.* Amsterdam: University of Amsterdam and KPMG.

KPMG. (2002). *KPMG international survey of corporate sustainability reporting 2002.* Amsterdam: De Meern and KPMG.

Krippendorff, K. (1980). *Content analysis: An introduction to its methodology.* Beverly Hills, CA: Sage.

Larsen, G. (2004). Accounting for sustainability. *Australian CPA*, p8.

Leftwich, R., Watts, R., & Zimmerman, J.L. (1981). Voluntary corporate disclosure: The case of interim reporting. *Journal of Accounting Research, 19,* 50-77.

Lewis, N.R., Mangos, N.C., & Tilt, C. (1995). *A review of environmental accounting: Issues for Australian accountants, corporations and regulators.* Melbourne: Australian Society of Certified Practicing Accountants Public Sector Accounting Centre of Excellence.

Maheshwari, G. (1992). Corporate characteristics and social responsibility reporting. *Asian Review of Accounting, 1*(1) 31-43.

Maitland, A. (2002). Companies start to detail what on earth is going on: Global reporting imitative by Alison Maitland: Explaining environmental and social issues show commitment to sustainable business. *Financial Times,* p 8.

Marston, C.L., & Shrives, P.J. (1991). The use of disclosure indices in accounting research: A review article. *British Accounting Review, 23*(1), 195-210.

Matthews, M.R., & Perera, M.H.B. (1995). *Accounting theory development* (3rd edition). Melbourne: Thomas Nelson.

Meek, G.K., Roberts, C.B., & Gray, S.J. (1995). Factors influencing voluntary annual report disclosures by US, UK and Continental European multinational corporations. *Journal of International Business Studies, 26*(3), 555-572.

Menard. S. (1995). *Applied logistic regression analysis.* Sage University paper series on quantitative applications in the social sciences, 7-106. Thousand Oaks, CA: Sage.

McKinnon, J.L., & Dalimunthe, L. (1993). Voluntary disclosure of segment information by Australian diversified companies. *Accounting and Finance, 33*(1), 33-50.

Miles, J., & Shevlin, M. (2001). *Applying regression and correlation: A guide for students and researches.* London: SAGE Publications.

Morhardt, J.E., Baird, S., & Freeman, K. (2002). Scoring environmental and sustainability reports. *Corporate Social Responsibility Environmental Management 9,* 215-233.

Ness, K.E., & Mirza, A.M. (1991). Corporate social disclosures: A note on a test of agency theory. *British Accounting Review, 23*(3) 211-217.

Newman, G. (2005). Ethical reporting poor. *The Australian*, p 24.

Oppenheim, A.N. (1992). *Questionnaire design, interviewing and attitude measurement.* London: St Martins Press.

Owen, D.L. (1982). The need for environmental accounting standards. *Accounting Forum, 17*(1) 31-46.

Pallant, J. (2001). *SPSS survival manual: A step by step guide to data analysis using SPSS.* Sydney: Allan and Unwin.

Panchapakesan, S., & McKinnon, J. (1992). Proxies for political visibility: A preliminary examination of the relation among some potential proxies. *Accounting Research Journal,* 71-80.

Pang, Y.H. (1982). Disclosures of corporate social responsibility: What is being disclosed? *The Chartered Accountants in Australia, 53*(1) 32-35.

Pokorny, M. (1991). *An introduction to econometrics.* Oxford: Basil Blackwell Ltd.

Priest, A. (1993). *Local government financial reporting: A survey of Western Australian practice and the examination of some explanatory economic and political factors.* Unpublished Honours Thesis, Edith Cowan University Perth, Western Australia.

Rarr. J. (2005). Corporate responsibility: Moral or mandatory? *Journal of Chartered Secretaries Australia Ltd, 52*(11), 656-661.

Raar, J. (2002). Environmental initiatives: Toward triple-bottom line reporting. *Corporate Communications: An International Journal, 7*(3), 169-183.

Roberts, R.W. (1992). Determinants of corporate social responsibility disclosures: An approach of stakeholder theory. *Accounting Organisations and Society, 17*(6) 595-612.

Rockness, J.W. (1985). An assessment of the relationship between US corporate environmental performance and disclosure. *Journal of Business, Finance and Accounting, 12*(3), 339-354.

Singhvi, S.S., & Desai, B. (1971). An empirical analysis of the quality of corporate financial disclosures. *The Accounting Review, 46*(1) 129-138.

Slater, A., & Gilbert, S. (2004). The evolution of business reporting: Make room for sustainability disclosure. *Environmental Quality Management, 14*(1), 41-48.

Spicer, B. (1978). Investors, corporate social performance and information disclosure: An empirical study. *The Accounting Review, 53*(1), 94-111.

SPSS 11.5 for Windows [Computer program]. (2002). Chicago, Ill.: SPSS.

Stevens, J. (1992). *Applied multivariate statistics for the social science* (2nd edition). Hillsdale, NJ: Lawrence Erlbaum Associate.

Sullivan, M. (2002). Beyond financial disclosure. *Australian CPA, 72*(11), 44.

SustainAbility-UNEP. (1996). *Engaging stakeholders: Volume 1: The benchmark survey*. London.

SustainAbility-UNEP. (1997). *The 1997 benchmark survey: The third international progress report on company environmental reporting*. London.

SustainAbiliy-UNEP. (2000). *The global reporting: The 2000 benchmarking survey.* London.

Tabachnick, B.G., & Fidell, L.S. (2001). *Using multivariate statistics,* (4th edition). Boston: Allyn and Bacon.

Teoh, S.H., & Wong, T.J. (1993). Perceived auditor quality and earnings response coefficients. *The Accounting Review, 68*(2), 346-367.

Tilt, C.A. (2001). The content and disclosures of Australian corporate environmental policies. *Accounting, Auditing and Accountability Journal, 14*(1) 190 -212.

Trotman, K.T. (1979). Social responsibility disclosures by Australian companies. *The Chartered Accountants in Australia, 49*(8) 24-28.

Trotman, K., & Bradley, G.W. (1981). Associations between social responsibility disclosure and characteristics of companies. *Accounting Organizations and Society, 6*(4), 355-362.

Watts, R.L. (1977). Corporate financial reporting: A product of the market and political process. In Ball, R. & Smith, C. W. (n. d). *The economics of accounting policy choice*. New York: McGraw Hill.

Watts, R.L., & Zimmerman, J.L. (1986). *Positive accounting theory*. New Jersey. Prentice Hall.

Whittred, G. (1987). The derived demand for consolidated financial reporting. *Journal of Accounting and Economics, 9*, 259-285.

Whittred, G., & Zimmer, I. (1986). Accounting information in the market for debt. *Accounting and Finance, 26*(2), 19-33.

Wiseman, J. (1982). An evolution of environmental disclosures made in corporate annual reports. *Accounting, Organisation and Society, 7* (1) 53-63.

Wong, J. (1998). Economic incentives for the voluntary disclosure of current cost financial statements. *Journal of Accounting and Economics*, 151-167.

Woods, M. (2003). The global reporting initiative. *The CPA Journal, 73*(6), 60.

Zeghal, D., & Ahmed, S.A. (1990). Comparison of social responsibility information disclosure media used by Canadian firms. *Accounting, Auditing and Accountability Journal, 3*(1) 38-53.

## Appendix A: Companies in the Sample

| No | ASX | Company Name | Industry |
|---|---|---|---|
| 1 | ADI | Adelphi Energy Limited | Energy |
| 2 | AWE | Australian Worldwide Exploration Ltd | Energy |
| 3 | AZZ | Antares Energy Limited | Energy |
| 4 | BUY | Bounty Oil & Gas NL | Energy |
| 5 | CHL | CCI Holdings Limited | Energy |
| 6 | COE | Cooper Energy Limited | Energy |
| 7 | CPN | Carpathian Resources Limited | Energy |
| 8 | CVN | Carnarvon Petroleum Limited | Energy |
| 9 | EBR | Eagle Bay Resources NL | Energy |
| 10 | EPR | Essential Petroleum Resources Limited | Energy |
| 11 | ESG | Eastern Star Gas Limited | Energy |
| 12 | EXL | Excel Coal Limited | Energy |
| 13 | GGP | Golden Gate Petroleum Ltd | Energy |
| 14 | GRV | Greenvale Mining NL | Energy |
| 15 | IOC | InterOil Corporation | Energy |
| 16 | KAR | Karoon Gas Australia Ltd | Energy |
| 17 | LNG | Liquefied Natural Gas Limited | Energy |
| 18 | MAG | Magellan Petroleum Australia Limited | Energy |
| 19 | MPO | Molopo Australia Limited | Energy |
| 20 | NEC | Northern Energy Corporation Limited | Energy |
| 21 | NHC | New Hope Corporation Limited | Energy |
| 22 | NZO | New Zealand Oil & Gas Limited | Energy |
| 23 | OPL | Orchard Petroleum Limited | Energy |
| 24 | PGS | Planet Gas Limited | Energy |
| 25 | PRE | Pacrim Energy Limited | Energy |
| 26 | ROC | Roc Oil Company Limited | Energy |
| 27 | SGL | Sydney Gas Ltd | Energy |
| 28 | STU | Stuart Petroleum Limited | Energy |
| 29 | WOR | WorleyParsons Limited | Energy |
| 30 | ADZ | Adsteam Marine Limited | Industrials |
| 31 | AIA | Auckland International Airport Limited | Industrials |
| 32 | AIX | Australian Infrastructure Fund | Industrials |
| 33 | ANG | Austin Engineering Limited | Industrials |
| 34 | AWS | Australian Waterwise Solutions Ltd | Industrials |
| 35 | BEI | Babcock & Brown Environmental Investments | Industrials |
| 36 | BKN | Limited Bradken Limited | Industrials |
| 37 | BOL | Boom Logistics Limited | Industrials |
| 38 | CDC | Child Care Centres Australia Limited | Industrials |
| 39 | CDX | CDS Technologies Limited | Industrials |
| 40 | CKS | Cordukes Limited | Industrials |
| 41 | CLL | P Cleland Enterprises Limited | Industrials |
| 42 | CNN | Cardia Technologies Limited | Industrials |

## Appendix A: Companies in the Sample (Continued)

| No | ASX | Company Name | Industry |
|---|---|---|---|
| 43 | COF | Coffey International Limited | Industrials |
| 44 | CPS | Computronics Holdings Limited | Industrials |
| 45 | CRU | Catalyst Recruitment Systems Limited | Industrials |
| 46 | CXP | Corporate Express Australia Limited | Industrials |
| 47 | EMB | Embelton Limited | Industrials |
| 48 | EON | Espreon Limited | Industrials |
| 49 | EWN | Erawan Company Limited | Industrials |
| 50 | GIL | Gregory Australia Limited | Industrials |
| 51 | HIL | Hills Industries Limited | Industrials |
| 52 | HIT | HiTech Group Australia Limited | Industrials |
| 53 | HJB | Hamilton James & Bruce Group Limited | Industrials |
| 54 | IWF | Integrated Group Limited | Industrials |
| 55 | KOV | Korvest Limited | Industrials |
| 56 | KTL | KTL Technologies Limited | Industrials |
| 57 | LMC | Lemarne Corporation Limited | Industrials |
| 58 | MAP | Macquarie Airports | Industrials |
| 59 | MIG | Macquarie Infrastructure Group | Industrials |
| 60 | MND | Monadelphous Group Limited | Industrials |
| 61 | MSI | Multistack International Limited | Industrials |
| 62 | NHR | National Hire Group Limited | Industrials |
| 63 | NMS | Neptune Marine Services Limited | Industrials |
| 64 | PCE | Pinnacle VRB Limited | Industrials |
| 65 | PMG | Peppercorn Management Group | Industrials |
| 66 | PRK | Patrick Corporation Limited | Industrials |
| 67 | PSN | Peninsular & Oriental Steam Navigation Company | Industrials |
| 68 | QED | QED Occtech Limited | Industrials |
| 69 | RCM | Reclaim Industries Limited | Industrials |
| 70 | REH | Reece Australia Limited | Industrials |
| 71 | SCC | Scott Corporation Limited | Industrials |
| 72 | SDS | SDS Corporation Limited | Industrials |
| 73 | SKY | Skydome Holdings Limited | Industrials |
| 74 | SLM | Salmat Limited | Industrials |
| 75 | SMA | SmartTrans Holdings Limited | Industrials |
| 76 | STP | Stericorp Limited | Industrials |
| 77 | SUP | Supersorb Environmental NL | Industrials |
| 78 | TEM | Tempo Services Limited | Industrials |
| 79 | TOX | Tox Free Solutions Limited | Industrials |
| 80 | UGL | United Group Limited | Industrials |
| 81 | WBA | Webster Limited | Industrials |
| 82 | APV | Access Providers LTD | Telecom. Ser. |
| 83 | EFT | Eftel Limited | Telecom. Ser. |
| 84 | ETC | Entertainment Media & Telecoms Corporation | Telecom. Ser. |

## Appendix A: Companies in the Sample (Continued)

| No | ASX | Company Name | Industry |
|---|---|---|---|
| 85 | JBM | Jumbuck Entertainment | Telecom. Ser. |
| 86 | MSO | Mobilesoft Limited | Telecom. Ser. |
| 87 | QAD | Quadrant Iridium Limited | Telecom. Ser. |
| 88 | QUE | Queste Communications Limited | Telecom. Ser. |
| 89 | TEL | Telecom Corporation of New Zealand Limited | Telecom. Ser. |
| 90 | UNW | Unwired Group Limited | Telecom. Ser. |
| 91 | AES | Advanced Energy Systems Limited | Utilities |
| 92 | EWC | Energy World Corporation Ltd | Utilities |
| 93 | GAS | GasNet Australia Group | Utilities |
| 94 | SOO | Solco Ltd | Utilities |
| 95 | AAQ | Australis Aquaculture Limited | Cons. Staples |
| 96 | AVF | Australian Value Funds Management Limited | Cons. Staples |
| 97 | AWL | Australian Wine Holdings Limited | Cons. Staples |
| 98 | CCL | Coca-Cola Amatil Limited | Cons. Staples |
| 99 | CHQ | Chiquita Brands South Pacific Limited | Cons. Staples |
| 100 | DMY | Dromana Estate Limited | Cons. Staples |
| 101 | EAC | East African Coffee Plantations Limited | Cons. Staples |
| 102 | FOA | Foodland Associated Limited | Cons. Staples |
| 103 | GFD | Green's Foods Limited | Cons. Staples |
| 104 | GNC | Graincorp Limited | Cons. Staples |
| 105 | LAL | Lowan Australia Limited | Cons. Staples |
| 106 | LWB | Little World Beverages Limited | Cons. Staples |
| 107 | MTS | Metcash Limited | Cons. Staples |
| 108 | NFD | National Foods Limited | Cons. Staples |
| 109 | PQB | Piquant Blue Limited | Cons. Staples |
| 110 | QCH | Queensland Cotton Holdings Limited | Cons. Staples |
| 111 | SRP | Southcorp Limited | Cons. Staples |
| 112 | WCB | Warrnambool Cheese and Butter Factory Company | Cons. Staples |
| 113 | ADB | Adelaide Bank Limited | Financials |
| 114 | AFS | Affiance Group Limited | Financials |
| 115 | AHO | Australian Hotel Fund | Financials |
| 116 | AMH | AMCIL Limited | Financials |
| 117 | ANZ | ANZ Banking Group Ltd | Financials |
| 118 | ARG | Argo Investments Limited | Financials |
| 119 | ASX | Australian Stock Exchange Limited | Financials |
| 120 | AXA | AXA Asia Pacific Holdings | Financials |
| 121 | AXI | Axiom Properties Limited | Financials |
| 122 | BEL | Bentley International Limited | Financials |
| 123 | BNB | Babcock & Brown Limited | Financials |
| 124 | BQF | Bakehouse Quarter Fund | Financials |
| 125 | CBA | Commonwealth Bank of Australia | Financials |
| 126 | CDF | Commonwealth Diversified Share Fund | Financials |

## Appendix A: Companies in the Sample (Continued)

| No | ASX | Company Name | Industry |
|---|---|---|---|
| 127 | CFI | Colonial First Private Capital Limited | Financials |
| 128 | CHF | Charter Pacific Corporation Limited | Financials |
| 129 | CIN | Carlton Investments Limited | Financials |
| 130 | CIY | City Pacific Limited | Financials |
| 131 | CMW | Cromwell Corporation Limited | Financials |
| 132 | CNR | Coonawarra Australia Property Trust | Financials |
| 133 | CPA | Commonwealth Property Office Fund | Financials |
| 134 | CWT | Challenger Wine Trust | Financials |
| 135 | DDF | Deutsche Diversified Trust | Financials |
| 136 | DUI | Diversified United Investment Limited | Financials |
| 137 | DVN | Devine Limited | Financials |
| 138 | EVG | Envirogold Limited | Financials |
| 139 | FKP | FKP Property Group | Financials |
| 140 | FLK | Folkestone Limited | Financials |
| 141 | FPG | Forest Place Group Limited | Financials |
| 142 | FRI | Finbar International Limited | Financials |
| 143 | GCA | GEC Asian Value Fund | Financials |
| 144 | GCH | GEC Australian Healthcare Fund | Financials |
| 145 | GOW | Gowing Brothers Ltd | Financials |
| 146 | GPT | GPT Group | Financials |
| 147 | HGL | Hudson Investment Group Limited | Financials |
| 148 | HHV | Hunter Hall Global Value Limited | Financials |
| 149 | HME | Home Building Society Limited | Financials |
| 150 | IAG | Insurance Australia Group Limited | Financials |
| 151 | ICD | Impact Capital Limited | Financials |
| 152 | IIG | Integrated Investment Group Limited | Financials |
| 153 | IOF | ING Office Fund | Financials |
| 154 | IYS | IYS Instalment Receipt Limited | Financials |
| 155 | JFG | James Fielding Group | Financials |
| 156 | LCP | Loftus Capital Partners Limited | Financials |
| 157 | LLC | Lend Lease Corporation Limited | Financials |
| 158 | MCH | Murchison Holdings Limited | Financials |
| 159 | MCK | MacarthurCook Limited | Financials |
| 160 | MDT | Macquarie DDR Trust | Financials |
| 161 | MGM | Macquarie Goodman Management Ltd | Financials |
| 162 | MIR | Mirrabooka Investments Limited | Financials |
| 163 | MOC | Mortgage Choice Limited | Financials |
| 164 | MPB | Mackay Permanent Building Society Limited | Financials |
| 165 | MRT | Mariner Retirement Solutions Limited | Financials |
| 166 | MTD | Metroland Australia Limited | Financials |
| 167 | OFM | OFM Investment Group Limited | Financials |
| 168 | OLP | Olympus Resources Limited | Financials |

## Appendix A: Companies in the Sample (Continued)

| No | ASX | Company Name | Industry |
|---|---|---|---|
| 169 | OPM | OAMPS Limited | Financials |
| 170 | PDZ | Prairie Downs Metals Limited | Financials |
| 171 | PHA | Public Holdings (Australia) Limited | Financials |
| 172 | PPC | Peet & Company Limited | Financials |
| 173 | PRV | Premium Investors Limited | Financials |
| 174 | RCD | Record Investments Limited | Financials |
| 175 | RMG | RMG Limited | Financials |
| 176 | SAP | Sabina Corporation Limited | Financials |
| 177 | SCF | Southern Cross FLIERS Trust | Financials |
| 178 | SDG | Sunland Group Limited | Financials |
| 179 | SFY | StreetTRACKS S&P/ASX 50 Fund | Financials |
| 180 | SGP | Stockland | Financials |
| 181 | SRV | Servcorp Limited | Financials |
| 182 | SSL | Sietel Limited | Financials |
| 183 | TAG | Tag Pacific Limited | Financials |
| 184 | TER | Terrain Australia Limited | Financials |
| 185 | TLT | Tourism & Leisure Trust | Financials |
| 186 | TPG | Taragon Property Fund | Financials |
| 187 | TRG | Treasury Group Limited | Financials |
| 188 | TTH | Tooth & Company Limited | Financials |
| 189 | UOS | United Overseas Australia Limited | Financials |
| 190 | VLL | Village Life Ltd | Financials |
| 191 | WLS | Wilson Leaders Limited | Financials |
| 192 | ADA | Adacel Technologies Limited | Info. Tech. |
| 193 | ASU | Alpha Technologies Corporation Limited | Info. Tech. |
| 194 | ASZ | ASG Group Limited | Info. Tech. |
| 195 | BPG | Byte Power Group Limited | Info. Tech. |
| 196 | BXP | Bill Express Limited | Info. Tech. |
| 197 | CDS | Comdek Ltd | Info. Tech. |
| 198 | CLT | Cellnet Group Limited | Info. Tech. |
| 199 | COO | Cosmos Limited | Info. Tech. |
| 200 | CPU | Computershare Limited | Info. Tech. |
| 201 | CTI | Chariot Limited | Info. Tech. |
| 202 | DES | Destra Corporation Limited | Info. Tech. |
| 203 | DTL | Data3 Limited | Info. Tech. |
| 204 | ESV | Eservglobal Limited | Info. Tech. |
| 205 | ETT | ETT Limited | Info. Tech. |
| 206 | HLI | Hailian International Limited | Info. Tech. |
| 207 | HPX | HPAL Limited | Info. Tech. |
| 208 | HZG | Horizon Global Limited | Info. Tech. |
| 209 | IAT | Iatia Ltd | Info. Tech. |
| 210 | IFM | Infomedia Limited | Info. Tech. |

## Appendix A: Companies in the Sample (Continued)

| No | ASX | Company Name | Industry |
|---|---|---|---|
| 211 | IRE | Iress Market Technology Limited | Info. Tech. |
| 212 | ITE | IT & e Limited | Info. Tech. |
| 213 | LGD | Legend Corporation Limited | Info. Tech. |
| 214 | LRX | Longreach Group Limited | Info. Tech. |
| 115 | MCL | M2M Corporation Limited | Info. Tech. |
| 116 | MLB | Melbourne IT Limited | Info. Tech. |
| 117 | MVU | Matrix View | Info. Tech. |
| 118 | MWC | Media World Communications Limited | Info. Tech. |
| 119 | MYO | MYOB Limited | Info. Tech. |
| 220 | OCL | Objective Corporation Limited | Info. Tech. |
| 221 | OHL | Omnitech Holdings Limited | Info. Tech. |
| 222 | PIE | pieNETWORKS Limited | Info. Tech. |
| 223 | PRO | Prophecy International Holdings Limited | Info. Tech. |
| 224 | RCI | Rocklands Richfield PCI Limited | Info. Tech. |
| 225 | RKN | Reckon Limited | Info. Tech. |
| 226 | SLX | Silex Systems Limited | Info. Tech. |
| 227 | SMX | SMS Management & Technology Limited | Info. Tech. |
| 228 | SOF | Sofcom Limited | Info. Tech. |
| 229 | SYN | ST Synergy Limited | Info. Tech. |
| 230 | TLZ | Telezon Limited | Info. Tech. |
| 231 | TSH | TSV Holdings Limited | Info. Tech. |
| 232 | TWO | Talent2 International Limited | Info. Tech. |
| 233 | VSL | Vision Systems Limited | Info. Tech. |
| 234 | WSS | Working Systems Solutions Limited | Info. Tech. |
| 235 | ACL | Alchemia Limited | Healthcare |
| 236 | ALT | Analytica Limited | Healthcare |
| 237 | ANN | Ansell Limited | Healthcare |
| 238 | AUH | Australian Healthcare Technology Ltd | Healthcare |
| 239 | AVS | Avastra Ltd | Healthcare |
| 240 | BKL | Blackmores Limited | Healthcare |
| 241 | BNE | Bone Medical Limited | Healthcare |
| 242 | BPH | BioPharmica Limited | Healthcare |
| 243 | BPO | BioProspect Limited | Healthcare |
| 244 | BTA | Biota Holdings Limited | Healthcare |
| 245 | CIR | Circadian Technologies Limited | Healthcare |
| 246 | CMP | Compumedics Limited | Healthcare |
| 247 | CST | Cellestis Limited | Healthcare |
| 248 | CXD | Cathrx Ltd | Healthcare |
| 249 | DVC | DCA Group Limited | Healthcare |
| 250 | ELX | Ellex Medical Lasers Limited | Healthcare |
| 251 | FPH | Fisher & Paykel Healthcare Corporation Limited | Healthcare |
| 252 | GAA | Genepharm Australasia Limited | Healthcare |

## Appendix A: Companies in the Sample (Continued)

| No | ASX | Company Name | Industry |
|---|---|---|---|
| 253 | GEN | Genesis Research & Development Corporation Limited | Healthcare |
| 254 | HSP | Healthscope Limited | Healthcare |
| 255 | ICS | ICSGlobal Limited | Healthcare |
| 256 | ITD | ITL Limited | Healthcare |
| 257 | LFE | Life Therapeutics Limited | Healthcare |
| 258 | MDE | MedAire Inc | Healthcare |
| 259 | MDV | Medivac Limited | Healthcare |
| 260 | MTR | Meditech Research Limited | Healthcare |
| 261 | MVP | Medical Developments International Limited | Healthcare |
| 262 | NEU | Neuren Pharmaceuticals Limited | Healthcare |
| 263 | OMI | Occupational & Medical Innovations Limited | Healthcare |
| 264 | PBI | Premier Bionics Limited | Healthcare |
| 265 | PGL | Progen Industries Limited | Healthcare |
| 266 | PLG | Prime Life Corporation Limited | Healthcare |
| 267 | PRR | Prima Biomed Ltd | Healthcare |
| 268 | PSD | pSivida Limited | Healthcare |
| 269 | PXS | Pharmaxis Ltd | Healthcare |
| 270 | RBY | Rockeby Biomed Limited | Healthcare |
| 271 | RHC | Ramsay Health Care Limited | Healthcare |
| 272 | SCV | SunnyCove Management Limited | Healthcare |
| 273 | SHC | Sunshine Heart Inc | Healthcare |
| 274 | SLA | Solagran Limited | Healthcare |
| 275 | SOM | Somnomed Limited | Healthcare |
| 276 | SYB | Symbion Health Limited | Healthcare |
| 277 | VGH | Vision Group Holdings Limited | Healthcare |
| 278 | ABS | A.B.C. Learning Centres Limited | Cons. Disc. |
| 279 | AEO | Austereo Group Limited | Cons. Disc. |
| 280 | AHD | Amalgamated Holdings Limited | Cons. Disc. |
| 281 | ANC | Angus & Coote (Holdings) Limited | Cons. Disc. |
| 282 | APN | APN News and Media Ltd | Cons. Disc. |
| 283 | ATH | Atech Holdings Limited | Cons. Disc. |
| 284 | AUN | Austar United Communications Ltd | Cons. Disc. |
| 285 | BCL | Betcorp Limited | Cons. Disc. |
| 286 | BER | Berklee Limited | Cons. Disc. |
| 287 | BKR | Becker Group Limited | Cons. Disc. |
| 288 | BRK | BreakFree Limited | Cons. Disc. |
| 289 | BRZ | Brazin Limited | Cons. Disc. |
| 290 | CCV | Cash Converters International | Cons. Disc. |
| 291 | CLB | Creatable Media Limited | Cons. Disc. |
| 292 | CXE | Celtex Limited | Cons. Disc. |
| 293 | DDT | DataDot Technology Limited | Cons. Disc. |
| 294 | EBT | eBet Limited | Cons. Disc. |

## Appendix A: Companies in the Sample (Continued)

| No | ASX | Company Name | Industry |
|---|---|---|---|
| 295 | ESL | Earth Sanctuaries Limited | Cons. Disc. |
| 296 | FXJ | John Fairfax Holdings Limited | Cons. Disc. |
| 297 | GBR | G Retail Limited | Cons. Disc. |
| 298 | GLB | Globe International Limited | Cons. Disc. |
| 299 | GXG | Green X Global Limited | Cons. Disc. |
| 300 | HCC | Hutchisons Child Care Services Ltd | Cons. Disc. |
| 301 | HWT | Harvey World Travel Group Limited | Cons. Disc. |
| 302 | HYO | Hyro Limited | Cons. Disc. |
| 303 | ION | ION Limited | Cons. Disc. |
| 304 | JBH | JB Hi Fi Limited | Cons. Disc. |
| 305 | KME | Kip McGrath Education Centres Limited | Cons. Disc. |
| 306 | LAS | Lasseters Corporation Limited | Cons. Disc. |
| 307 | MHI | Merchant House International Limited | Cons. Disc. |
| 308 | MRL | Miller's Retail Limited | Cons. Disc. |
| 309 | MRN | Macquarie Radio Network Limited | Cons. Disc. |
| 310 | NCK | Nick Scali Limited | Cons. Disc. |
| 311 | NSA | Norwood Systems Ltd | Cons. Disc. |
| 312 | OPC | Optima Corporation Limited | Cons. Disc. |
| 313 | PBB | Pacifica Group Limited | Cons. Disc. |
| 314 | PMX | Palamedia Limited | Cons. Disc. |
| 315 | PPN | Planet Platinum Limited | Cons. Disc. |
| 316 | RCL | Repco Corporation Limited | Cons. Disc. |
| 317 | REA | realestate.com.au Limited | Cons. Disc. |
| 318 | SAQ | Sydney Attractions Group Limited | Cons. Disc. |
| 319 | SAX | Stadium Australia Group | Cons. Disc. |
| 320 | SBC | Southern Cross Broadcasting Ltd | Cons. Disc. |
| 321 | SFC | Schaffer Corporation Limited | Cons. Disc. |
| 322 | SGS | Stargames Limited | Cons. Disc. |
| 323 | STV | Sunraysia Television Limited | Cons. Disc. |
| 324 | SWG | Swish Group Limited (The) | Cons. Disc. |
| 325 | TLC | Tourism, Hotels & Leisure Limited | Cons. Disc. |
| 326 | WAG | WorldAudio Limited | Cons. Disc. |
| 327 | AAM | A1 Minerals Limited | Materials |
| 328 | ADX | Audax Resources Limited | Materials |
| 329 | AEC | Ammtec Limited | Materials |
| 330 | AGS | Alliance Resources Limited | Materials |
| 331 | AGZ | A.G.D. Mining Limited | Materials |
| 332 | ALK | Alkane Exploration Ltd | Materials |
| 333 | ANE | Auspine Limited | Materials |
| 334 | ANU | Aconcagua Resources Limited | Materials |
| 335 | APG | Austpac Resources NL | Materials |
| 336 | ARE | Argonaut Resources NL | Materials |

## Appendix A: Companies in the Sample (Continued)

| No | ASX | Company Name | Industry |
|---|---|---|---|
| 337 | ARO | Astro Diamond Mines NL | Materials |
| 338 | ATM | Aneka Tambang (Persero) Tbk (Pt) | Materials |
| 339 | ATR | Astron Limited | Materials |
| 340 | AUZ | Australian Mines Limited | Materials |
| 341 | AVO | Avoca Resources Limited | Materials |
| 342 | AXC | AXG Mining Limited | Materials |
| 343 | AZC | Australian Zircon NL | Materials |
| 344 | BAR | Barra Resources Limited | Materials |
| 345 | BGF | Ballarat Goldfields NL | Materials |
| 346 | BKA | Buka Minerals Limited | Materials |
| 347 | BLR | Black Range Minerals Limited | Materials |
| 348 | BMX | Bemax Resources NL | Materials |
| 349 | CAA | Capral Aluminium Limited | Materials |
| 350 | CAS | Crusader Holdings NL | Materials |
| 351 | CDH | Chongherr Investments Ltd | Materials |
| 352 | CFR | Cluff Resources Pacific NL | Materials |
| 353 | CME | Centralian Minerals Limited | Materials |
| 354 | CNT | Centamin Egypt Limited | Materials |
| 355 | CPI | CPI Group Limited | Materials |
| 356 | CRS | Croesus Mining NL | Materials |
| 357 | CSM | Consolidated Minerals Limited | Materials |
| 358 | CSR | CSR Limited | Materials |
| 359 | CUO | Copperco Limited | Materials |
| 360 | CWH | China West International Holdings Limited | Materials |
| 361 | DNL | Discovery Nickel Limited | Materials |
| 362 | DOM | Dominion Mining Limited | Materials |
| 363 | DRX | Diatreme Resources Limited | Materials |
| 364 | DYL | Deep Yellow Limited | Materials |
| 365 | ELL | Ellendale Resources NL | Materials |
| 366 | EMP | Emperor Mines Limited | Materials |
| 367 | EQM | Equatorial Mining Limited | Materials |
| 368 | EXS | Exco Resources NL | Materials |
| 369 | FBU | Fletcher Building Limited | Materials |
| 370 | FCN | Falcon Minerals Limited | Materials |
| 371 | GAU | Great Australian Resources Limited | Materials |
| 372 | GBG | Gindalbie Metals Ltd | Materials |
| 373 | GED | Golden Deeps Limited | Materials |
| 374 | GGN | Gallery Gold Limited | Materials |
| 375 | GLN | Gleneagle Gold Limited | Materials |
| 376 | GML | Gateway Mining NL | Materials |
| 377 | GNL | Great Gold Mines NL | Materials |
| 378 | GRK | Green Rock Energy Limited | Materials |

## Appendix A: Companies in the Sample (Continued)

| No | ASX | Company Name | Industry |
|---|---|---|---|
| 379 | GRN | Gravity Diamonds Limited | Materials |
| 380 | GUL | Gullewa Limited | Materials |
| 381 | GUN | Gunson Resources Limited | Materials |
| 382 | HCY | Halcyon Group Ltd | Materials |
| 383 | HDN | Haddington Resources Limited | Materials |
| 384 | HGO | Hillgrove Resources Limited | Materials |
| 385 | HLS | Hillcrest Litigation Services Limited | Materials |
| 386 | HLX | Helix Resources Limited | Materials |
| 387 | HTM | Heritage Gold NZ Limited | Materials |
| 388 | IGO | Independence Group NL | Materials |
| 389 | INI | Intercoal Limited | Materials |
| 390 | INL | Intec Ltd | Materials |
| 391 | IVN | Ivanhoe Mines Ltd | Materials |
| 392 | JAG | Jaguar Minerals Limited | Materials |
| 393 | JBM | Jubilee Mines NL | Materials |
| 394 | JRL | Jindalee Resources Limited | Materials |
| 395 | JRV | Jervois Mining Limited | Materials |
| 396 | KZL | Kagara Zinc Ltd | Materials |
| 397 | LAF | Lafayette Mining Limited | Materials |
| 398 | LKE | Lake Resources NL | Materials |
| 399 | LMG | Latrobe Magnesium Limited | Materials |
| 400 | MAR | Malachite Resources NL | Materials |
| 401 | MCC | Macarthur Coal Limited | Materials |
| 402 | MCO | Mount Conqueror Minerals NL | Materials |
| 403 | MGK | Magnesium International Limited | Materials |
| 404 | MGO | Marengo Mining Limited | Materials |
| 405 | MLM | Metallica Minerals Limited | Materials |
| 406 | MML | Medusa Mining Ltd | Materials |
| 407 | MPD | Millepede International Limited | Materials |
| 408 | MPI | Mark Sensing Limited | Materials |
| 409 | MSC | Minerals Corporation Limited | Materials |
| 410 | MTB | Mount Burgess Mining NL | Materials |
| 411 | MTH | Mithril Resources Limited | Materials |
| 412 | NCI | National Can Industries Limited | Materials |
| 413 | NHM | New Holland Mining NL | Materials |
| 414 | NLB | Nullarbor Holdings Limited | Materials |
| 415 | NMC | Nustar Mining Corporation Limited | Materials |
| 416 | NWA | New World Alloys Limited | Materials |
| 417 | OGD | Oceana Gold Limited | Materials |
| 418 | OMH | OM Holdings Limited | Materials |
| 419 | ORO | Oroya Mining Limited | Materials |
| 420 | PDM | Paradigm Gold Limited | Materials |

## Appendix A: Companies in the Sample (Continued)

| No | ASX | Company Name | Industry |
|---|---|---|---|
| 421 | PEL | Pelican Resources Limited | Materials |
| 422 | PMA | Precious Metals Australia Limited | Materials |
| 423 | PMH | Pacific Magnesium Corporation Limited | Materials |
| 424 | PPX | PaperlinX Limited | Materials |
| 425 | PPY | Papyrus Australia Limited | Materials |
| 426 | PSH | Penrice Soda Holdings Limited | Materials |
| 427 | PTS | Platsearch NL | Materials |
| 428 | QUR | Quantum Resources Limited | Materials |
| 429 | REM | Reliance Mining Limited | Materials |
| 430 | RIM | Rimfire Pacific Mining NL | Materials |
| 431 | RND | Rand Mining NL | Materials |
| 432 | RNG | Range River Gold Limited | Materials |
| 433 | RTM | Reefton Mining NL | Materials |
| 434 | RWD | Reward Minerals Ltd | Materials |
| 435 | RXL | Rox Resources Limited | Materials |
| 436 | SBS | Sub-Sahara Resources NL | Materials |
| 437 | SCX | Southern Cross Exploration NL | Materials |
| 438 | SHN | Sherlock Bay Nickel Corporation Limited | Materials |
| 439 | SIB | Siberia Mining Corporation Limited | Materials |
| 440 | SPH | Sphere Investments Limited | Materials |
| 441 | SRI | Sipa Resources Limited | Materials |
| 442 | TAA | Tantalum Australia NL | Materials |
| 443 | TAM | Tanami Gold NL | Materials |
| 444 | TAS | Tasman Resources NL | Materials |
| 445 | TGF | Tianshan Goldfields Limited | Materials |
| 446 | TGS | Tiger Resources Limited | Materials |
| 447 | TKR | Triako Resources Limited | Materials |
| 448 | TYC | Tethyan Copper Company Limited | Materials |
| 449 | YML | Yilgarn Mining Limited | Materials |
| 450 | ZIM | Zimplats Holdings Limited | Materials |